

GENERAL SEMANTICS

R. S. J. Carrigan

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ABSTRACT

What is meaning? What is a meaner? I take the view that, using the everyday, pretheoretic notion of meaning as a guide, an attempted answer to the second question is an attempted answer to the first, since meaning is only found in meaners. Further, I claim that an attempted answer to the second question should not be based on such unexplained psychological and semantic terms as intention, truth, reference, meaning, but on terms which are more directly compatible with an assumption that some kind of physicalism is true.

The notion that meaning is in the individual, is a property of a meaner, has been explicitly attacked by Putnam and more obliquely by Fodor. Chapter 1 examines some of their contentions and finds them wanting.

In Chapter 2, I argue that the explanation of meaning should begin with individual meaners and then be extended to meaning communities. Some interpretations of Wittgenstein's private-language argument augur badly for such an approach and I spend some time looking at these interpretations. What makes an individual meaner a meaner, I claim, is the possession of an instantiation of a semantic apparatus, and it is with a partial, attempted description of this semantic apparatus that I am largely concerned.

A model of the semantic apparatus is sketched in Chapter 2, and extended and refined to take account of language and public language in Chapter 3, truth, presupposition, and negation in Chapter 4, and sense relations in Chapter 5.

Chapter 3, whilst assuming that many syntactic rules are independent of semantics, argues that the primitives of syntax are a subset of those of semantics.

Chapter 4 argues against Strawsonian presupposition and for scopal negation, whilst taking a view of truth that has some kind of correspondence theory as its base, but allows coherence considerations to override.

Chapter 5 offers some explications of synonymy, hyponymy, and antonymy, using these to explain analyticity, and claims, contra Quine, that since meaning is explicable in terms other than synonymy, the traditional synthetic/analytic distinction can be maintained.

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DECLARATION

I hereby declare that this thesis is of my own composition and that its contents are my own work.

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0. Introduction

0.0 Meaners

This essay is an attempted answer to the question:

(1) What makes a meaner a meaner?

This is an interesting question for a number of reasons, not the least of which is that any satisfactory answer is going to have to say something fairly specific about meaning: What it is and how it arises. There would, however, be ways of answering (1) and saying something about meaning which whilst possibly interesting and clarifying would not serve the intended purpose here. Such answers would avail themselves of unexplained psychological and semantical terms such as, true, refer, denote, intention, meaning. Answers involving such unexplained terms would be unsatisfactory in the sense that they do not talk about meaning in such a way that it makes perfectly good sense to ask, say, whether this animal or that is a meaner or whether this machine or that alien is a meaner. The reason it would not make perfectly good sense is that terms such as intending, meaning, and referring are typically used of humans and we have no more way of extending these to machines than we have at present of extending the notion of being a meaner to machines.

The assumption that an answer to (1) can be given in non-semantic and non-psychological terms here amounts to the claim that physicalism is true. By physicalism I mean the doctrine that psychological, biological, and semantic facts are explicable in terms of physical facts (cf. Field, 1972). This does not mean that for each semantic, psychological, and biological category there will be a physical one. To assume that this is the case would be to assume that such disciplines do not cross classify the phenomena of the world - and this seems most unlikely since it would require that the categories of semantics, psychology and biology coincide exactly with the categories of physics as delimited by postulated natural laws. More likely, as pointed out by Fodor¹ (1975), a category of semantics, biology, or psychology will involve several categories of physics. Such physicalism, Fodor (op. cit. : 12) calls token physicalism to distinguish it from kinds of physicalism embracing stronger reductionist claims. For convenience and brevity, I shall just use the term physicalism in the ensuing text to mean "token physicalism" or something rather like it.

Now, however, it might be claimed, a problem has arisen because, on the one hand, what makes a meaner a meaner is to be explicated in non-semantic and non-psychological terms, but on

¹ Fodor made this point forcefully, but the idea was not new, cf. Nagel 1965, for example.

the other hand, a type of physicalism is embraced which holds it unlikely that there is a one to one correspondence of psychological and semantic categories with physical ones; so any theory must be couched in terms other than semantic, psychological, or physical. I think that this is all true but not a problem. The language of the theory will certainly not be the language of physics. The properties specified in the theory will most likely not correspond to categories of physics on a one-to-one basis, but, nonetheless, such properties, it is claimed, will be recognisable as physical phenomena. The descriptions the theory will give will be of a kind which only partially specify the phenomena under consideration. The partial specification is adequate because the theory is only concerned with certain properties and not with the concomitant properties of such properties. Suppose the theory, for example, specified that some of its objects were to have the property of being able to be seen from a certain point, y, then such a description might involve many things which had nothing in common except the specified property. Although the laws of physics would cover what was involved in being able to be seen from a point y it's not at all the case that physics has a category for such a phenomenon. "Being able to be seen from y" is just not a category of physics, but it does describe a phenomenon which one could look for, investigate, and give a description of by using a number of categories of physics.

Field (1972) introduced the term semanticalism for the

doctrine that there are irreducibly semantic facts, where irreducible here is to mean something like "inexplicable in terms of physics". Field likens semanticalism to Cartesianism and vitalism. Cartesianism claims that there are irreducible facts of the mind, i.e. that the mind is something over and above the brain. Vitalism claims that there are irreducible biological facts, i.e. that a living organism is something over and above the atoms and their properties out of which it is composed. One cannot decide a priori whether Cartesianism, vitalism, or semanticalism is right or wrong, but one way to get nearer to the truth is to adopt a physicalist approach, for as Field says:

....physicalism should be accepted until we have convincing evidence that there is a realm of phenomena it leaves out of account. Even if there DOES turn out to be such a realm of phenomena, the only way we'll ever come to know that there is, is by repeated efforts and repeated failures to explain these phenomena in physical terms. (1972, page 92 in reprint in Platts 1980)

I happen to believe that some form of physicalism is true, but even if I didn't believe it, attempting an account of semantics in non-semantic terms would seem to be the best (only?) step to take in getting nearer the truth.

0.1 The Scope of the Theory

What the theory to be proposed seeks to explain is the minimum requirement for a meaner to be a meaner. Such a minimum requirement I call the semantic apparatus (v. 1.2).

Specifically not covered by the theory is any explanation of what guides the workings of the semantic apparatus when choice is available. Such explanation might well involve the large problems of intentionality, freewill, and consciousness. In attempting to make progress in semantics, it is necessary to restrict the field as much as possible and to avoid related areas, such as consciousness, which at the present time offer insurmountable difficulties. The hope and expectation is that a clearer understanding of in what the semantic apparatus consists will help towards an understanding of these other problems.

Of course, such a restriction of scope will seem unsatisfactory to someone who insists that a meaner must be conscious or intend this or that. To such a person, I can only repeat that if consciousness and intentionality are something over and above the semantic apparatus (and this is not necessarily a foregone conclusion), then it is still better to restrict the scope of the theory to an area which promises some progress rather than expand it to one that promises little. This may seem like looking for a lost match at night underneath a street light because "it's lighter there", but the worst that might be concluded is that one is looking for two lost matches, one of which is under the street light.

0.2 Some Conventions

In talking about language and meaning one has, of course, to use language itself. This requires that certain conventions be adopted in order to maintain sense and clarity. I take it as a basic truism that signs always occur in referring mode. By referring mode, I mean that a sign always signs something, otherwise it would not be a sign (hence "truism"), and what it signs is never its own form or meaning, but rather its would-be referent. If a sign signed its own form, then, of course, it would be a sign no longer for what distinguishes a sign from a non-sign is the fact that it is taken to sign something other than itself. That a sign always signs its would-be referent and not its meaning is much harder to explain, but it appears to have to do with the fact that whilst a would-be referent can be a meaning (but not the meaning of the sign itself), many would-be referents cannot be meanings. Hence, if a sign always signed its own meaning, then only meanings could be would-be referents. This would leave the vast majority of the world as something which could not be talked about at all. Before introducing the conventions I shall adopt to distinguish the three would-be referents of the form of a sign, the meaning of a sign, and of the would-be referent of a sign, some potential misunderstandings about the notion of the referring mode must be forestalled.

First, it matters not at all that many language items do not denote (for this and other reasons it is necessary to talk of

would-be referents), for suppose that I am talking of unicorns, then I am not talking about the word unicorn or about the meaning of the word unicorn, but about unicorns, and in using the word unicorn, I cannot but help speak about unicorns even though there are none. In language, one may speak as easily of the non-existent as of the existent, but always one speaks of would-be referents because with language one can do nothing else.

Second, a sign by itself is not a sign at all: it is only a sign for a meaner. Signs per se, therefore, do not themselves refer, but speakers and hearers² may refer in using signs. Hence another reason for the would-be in would-be referent.

Third, although for a sign to be in referring mode it is not necessarily the case that it should denote, qualms might arise in connection with the full/form word distinction since form words are often scarcely allowed to have meaning, let alone would-be referents. Ullman (1962 :43 ff) traces the full/form word distinction back to Aristotle and in more recent times such a distinction has often been made although a variant vocabulary: full/empty, content/empty, lexical/functional, has sometimes been employed. Ullman (: 43) characterises the full/form word distinction like this:

² Lyons (1977 : 177) stresses the role of the speaker in referring, but a good case may be made out for the hearer being the principal referrer since it is always the hearer that decides whether a sign is to be taken as referring or not and to what it is the sign refers.

The distinction is based on purely semantic criteria. Consider the following two groups of words:

<u>tree</u>	<u>the</u>
<u>sing</u>	<u>it</u>
<u>blue</u>	<u>of</u>
<u>gently</u>	<u>and</u>

It is obvious that the words in the first column have some meaning even if they appear in isolation, as they do on this page, whereas those in the second column have no independent meaning proper: they are grammatical elements which will contribute to the meaning of the phrase or the sentence when used in conjunction with other words.

If, as Ullman claims, form words "have no independent meaning proper" then how is compositionality of meaning preserved in the case of constructions involving form words? That compositionality of meaning is preserved with regard to form words is clearly evident from the fact that having learnt the use of and in some constructions, one can go on not only to construct a vast number of novel constructions involving and but also to understand these novel constructions. If and did not bring a regularly identifiable portion of meaning to all these constructions, then understanding would be impossible. But if and always brings a particular portion of meaning to the constructions into which it enters, why not allow that this is the meaning of and? After all, if I change and for of the meaning changes in a regular and predictable way whatever the other elements of the construction.

Part of the difficulty of ascribing, or the unwillingness to ascribe, meanings to form words may stem from the fact that many

of them denote relations rather than objects; but I find it hard to doubt that there is onness, inness, andness, toness, and fromness, etc. in the world and that words such as on, in, and, to, from not only denote but can be used to refer. Virtually all writers recognise that a full/form word demarcation line cannot be drawn with any precision. Gleason (1955 : 156), for example, views function words (i.e. form words) as forming a cline from those that are purely structural markers to those which have considerable lexical meaning. I doubt that a purely structural marker can be found because of the compositionality argument advanced above and I see no substantial objection to a uniform view of language that assumes that when one uses form words, such as and, the, and of, one is just as much talking about andness, theness, and ofness as one is talking about brickness and womanness when one uses the words brick and woman.

Granted that all language is in referring mode all of the time, the conventions needed to talk about word forms and word meanings are two new signs. I shall use the following two new signs:

Cat :- has as its would-be referent the word form
underlined.

"cat":- has as its would-be referent the meaning of the
word form within quotation marks, i.e. the meaning
of cat.

Of course, whilst we have a very clear idea about what the form of a word is, there is much less clarity concerning what meaning is.

The ensuing chapters will make an attempt at getting a firm grasp on the notion of meaning and on what meaning itself is.

Many writers do not make the threeway distinction between cat, cat, and "cat" (Leech, 1974 is one of the exceptions) and in such cases it is often not clear what their use of quotation marks signifies: is it the word form or the meaning, or both? Semantics is a confusing enough subject without adding to that confusion unnecessarily. However, having said that, it must be admitted straight away that underlining and quotation marks will be used for other purposes in the text. Some of these other uses will be to indicate titles, direct quotations or scare or shudder quotes. Hopefully, context will stop such uses being confused with the above conventions.

0.3 The Approach

General semantics as pursued here provides a way of linking language with the world, of bridging the gap between meaning and external objects. The main object of the ensuing chapters will be to map out on a broad front a sketch of a theory of general semantics rather than concentrate on an in-depth study of one particular aspect of such a theory. In the choice between depth and breadth in theorising, the former is often held in higher regard and the hand waving that it necessarily involves at a more general theory into which it might fit is readily accepted. But both types of theorising are needed and, indeed,

it is only the broad approach which can locate and relate narrower approaches into a more comprehensive and comprehensible whole. However, if narrow theorising hand waves at a more general theory in which it is supposedly embedded, then broad theorising hand waves at much detail which it assumes can be filled in. I believe that in the present state of semantics as it impinges on the world at large and meaners in particular, broad theorising is needed into which later, hopefully, much detail can be fitted.

In chapter 1, I set the scene by outlining my approach and considering some claims by Putnam and Fodor which, if sustainable, would render it still-born. Towards the end of the chapter, I mention the terminology, of which I am afraid there is rather a lot, that the reader will meet and I refer the reader to the appendix where the majority of this terminology is listed. The use of such terminology allows for a brevity, clarity, and over all comprehensibility, which could not otherwise be obtained, and I strongly recommend the reader to bear with it for this reason.

Chapter 2 emphasises and expands the claim that in considering meaning, general semantics must start with meaning in the individual rather than with meaning in society. This view leads to a possible clash with Wittgenstein's purported claims about private language and I consider the matter in some detail.

Whilst chapter 2 deals exclusively with meaning and the individual, the next three chapters connect the individual meaner to the world and to other meaners, whilst continuing to expand the explication of meaning in terms of the individual. Language

is closely connected to meaning and this is taken up in chapter 3, where criteria for language in general and public language in particular are suggested.

The connection between language and meaning is only rivalled in its strength by that of the connection between meaning and truth. This latter connection is discussed in chapter 4, where the closely related questions of presupposition and negation are also treated.

In the fifth and final chapter, I consider sense relations both in respect of individual meaning and public meaning. Sense relations, synonymy, antonymy, hyponymy, underpin many of our inferences and their importance is hard to over-estimate. One consequence of sense relations is analyticity, and concerning this I argue, contra Quine, for the traditional distinction between the synthetic and the analytic.

1. An Approach to Semantics

1.0 The Meaning of Meaning

Many works on semantics begin with or include a consideration of what the terms meaning and mean mean. This is only to be expected because semantics is the study of meaning and what better way to find out what one is studying than to find out what meaning means?

Ogden and Richards (1923) were perhaps the most assiduous in this respect, listing no less than twenty-two definitions of meaning. Leech (1974), however, sounds a warning note concerning this way of proceeding. He observes that it is somewhat odd to be so concerned with the term meaning in semantics when meaning (and not the term meaning) is the very object of investigation. This is to say that if we could give a satisfactorily detailed definition of the term meaning then it is not at all clear that we should have anything left to investigate. Leech maintains that it is the semantic theory which will determine what the term meaning means within the theory.

Leech seems quite correct in holding that a theory determines the meaning of its terms (at least, ideally so), but what of the situation prior to the construction of the theory?

The terms meaning and mean are used to refer to a number of phenomena, some of which we may wish to study and some of which we may not. Some attempt, however imprecise, at a pretheoretical identification of the type of meaning to be investigated seems to be required.

The type of meaning with which this study is concerned approximates to that which Grice (1957) identified as nonnatural meaning and to that typically associated with Peirce's (1931-35) subcategory of signs called symbols. This type of meaning is to be distinguished from that exemplified in (1) and (2).

- (1) Those clouds mean rain.
- (2) The meaning of those clouds is rain.

The sense in which clouds mean rain in (1) and (2) is that a natural consequent of at least some clouds is rain. Such consequents have nothing to do with meaners: rain would still fall from clouds even if there were no meaners. For Grice, clouds mean naturally. Clouds were signs for Peirce too and belong to his subcategory of signs, indexes. An index sign is one that according to Peirce is in some sense intrinsically connected to what it signs or indicates.

In contrast, the word door¹ means "door" nonnaturally. The

¹ Lest there should be any confusion: door means and has meaning, but it is not a meaner in the sense that I wish to use that term. I restrict the term meander for somebody or something in which meaning arises. Left to its own devices no meaning would ever arise in the case of door.

relationship is arbitrary in the sense that there is nothing intrinsic in door or "door" which connects them, and if they were not connected they would not, therefore, be intrinsically different. Clouds are different: if clouds never meant rain, then clouds or rain would be intrinsically different from what they are.

This is vague, but precision can only come with the theory; nonetheless, the phenomenon of nonnatural meaning, the object of this study, should be recognisable from what has been said. This study is concerned, then, with how (not why!) it is that door means "door" but could quite easily have meant something or nothing else.

(There are, of course, other senses of meaning and mean with which I am not concerned. These, I take it, are sufficiently different from the senses discussed above as not to require separate exclusion.)

1.1 Where are Meanings?

- (1) Cut the pie any way you like, 'meanings' just
ain't in the head.² (Putnam, 1975 : 227)

² The use of quotation marks around meanings by Putnam is puzzling. Such marks seem to be put to various uses in his article and hence one cannot divine their significance in (1). Since I take it that here Putnam is talking about the phenomena of meanings I should have expected no quotes at all.

Since humans are meaners and since the theory to be proposed claims that meaning is to be found, and only to be found, in meaners, Putnam's claim, if true, would make the exercise pointless. Some consideration of Putnam's argument is therefore called for.

Putnam first sets forth two principles which he feels (must feel in the light of (1)) anyone that believes meanings are in the head is committed to

- (I) That knowing the meaning of a term is just a matter of being in a certain psychological state.
- (II) That the meaning of a term (in the sense of intension) determines its extension (in the sense that sameness of intension entails sameness of extension). (op.cit.:219)

From these, after noting certain difficulties with the terms psychological state and extension, Putnam concludes a third principle:

- (III) Psychological state determines extension (op.cit.:222).

I will ignore the difficulties with the term extension which Putnam rightly notes. However, when it comes to the term psychological state, Putnam says that this is to be taken in what he calls a narrow sense. A psychological state in the narrow sense requires, according to Putnam, that that state does not

presuppose the "existence of any individual other than the subject to whom that state is ascribed. (In fact, the assumption was that no psychological state presupposes the existence of the subject's BODY even: if P is a psychological state, properly so called, then it must be logically possible for a 'disembodied mind' to be in P.)" (op.cit.:220). To take such a position regarding psychological states is to adopt, according to Putnam, "the assumption of methodological solipsism" (op.cit.:220). The importance of the way in which Putnam uses the term psychological state will shortly emerge.

There is, I think, good reason to believe that principle (II) is false, but for the moment I shall accept it, returning to consider it in a little while.

What Putnam claims to show is that (III) is false and, hence, that (I) and (II) cannot both be true. His main argument for this is along the following lines.

We are to suppose that there is out in space a twin-earth exactly alike earth in all respects, even down to the people, with the exception of one: what is called water on twin-earth is not of the same chemical type as water on earth. Rather, the stuff being called water on twin-earth we are to assume has a chemical composition abbreviated XYZ. Looking down on both earth and twin-earth we could then see that the term water has two meanings, in the sense of extension: on earth it refers to H_2O , on twin-earth to XYZ. We are further to suppose that the year is 1750 and that chemistry is in its infancy on both earth

and twin-earth. No-one knows, therefore, that the water on earth is different from that on twin-earth, after all, it looks the same, it tastes the same and presumably it performs the same in any usage current in 1750.

Consider now an English speaking $Oscar_1$ on earth and his English speaking counterpart, $Oscar_2$, on twin-earth. $Oscar_1$ and $Oscar_2$ are as alike as one could wish, right down to their beliefs about water. Putnam now claims that $Oscar_1$ and $Oscar_2$ were in the same psychological state in 1750 concerning the term water but that the extensions of that term were very different on earth and twin-earth. Of course, we would not learn that the extension of water was different on earth from that of twin-earth until chemical analysis had been developed, but once it had, Putnam argues, then we would maintain that the extensions had always been different and not that the extension of water had changed.

Putnam's view here stems from his view on natural kinds. Water is a natural kind and it is identified, according to Putnam, not simply by its nominal characteristics, such as being colourless, tasteless, wet, etc. but also by its being the same kind of stuff as we or somebody else called water yesterday, or a hundred or a thousand years ago. Putnam calls this relation same_L. The same_L relation is different on earth from what it is on twin-earth in the sense that the defining substances, those which were baptised water, are different. For brevity, let's call the same_L relation regarding

XYZ on twin-earth same_{LT}, and the same_L relation regarding H₂O on earth same_{LE}.

The meaning of natural kind terms, like water, involve indexing, i.e. a pointing towards a particular substance at a particular time and place as an example of the type of stuff that water can be used to refer to on subsequent occasions.

Searle (1983) believes that such indexicality is Putnam's undoing for he says that all Putnam has succeeded in doing is to substitute for a traditional cluster-of-concepts intentional content an indexical intentional content (: 204). If we correlate Searle's intentional contents with Putnam's psychological states, then we can perhaps see what Searle is getting at: if an earthian's psychological state concerning water includes an indexical content, that content will be or concern same_{LE}, and if a twin-earthian's psychological state concerning water includes an indexical content, that content will be or concern same_{LT}; but then the psychological states will be different and not, as Putnam claimed, the same and hence, their determining different extensions is a distinct possibility.

Does Searle's argument succeed? If it doesn't then I think that nothing can given an acceptance of principles (I) and (II). To see that this is so consider (A) and (B) below, which are respective descriptions of the earthian and twin-earthian psychological states concerning water.

- (A) The stuff which is colourless, tasteless, wet,

and is of the same structure as the stuff other people of my earthian community have called water for the last hundred years.

- (B) The stuff which is colourless, tasteless, wet, and is of the same structure as the stuff other people of my twin-earthian community have called water for the last hundred years.

Clearly, (A) and (B) are different and the fact that they can determine different extensions is as I have said a distinct possibility. It is to be noted that it is only a possibility: it is agreed (Putnam included) that different psychological states can determine the same extension, the traditional example of this being the terms creature with a heart and creature with a kidney. What is not clear, however, is that (A) and (B) are allowable characterisations of psychological states in Putnam's terms. It was pointed out earlier that Putnam holds that the term psychological state in his argument is to be read in the narrow sense, i.e. for the sake of argument, he embraces the assumption of methodological solipsism. It will be recalled from the quotation given earlier in this connection that psychological states in the narrow sense cannot presuppose the existence of other people (and presumably not, therefore, of any other thing) or, indeed, even the existence of the body of the individual who is in the psychological state.

(A) and (B) make specific reference, however to other individuals and another thing (i.e. water). Indeed, all indexical meanings must make reference to what is being indexed and it would appear that the assumption of methodological solipsism, as depicted by Putnam, rules out any such meanings being psychological states in the narrow sense.

If this is true then, on Putnam's terms, Searle's argument must fail and so must all arguments against Putnam's position, for psychological states in the narrow sense cannot by fiat presuppose the things indexed as indexical meaning requires. Indeed, the situation is more severe than this, since it appears that narrow psychological states belong to a different logical category from that of indexical meaning. Ryle (1949) introduced the notion of category mistake as being the attempting to combine two categories (in Ryle's particular concern, body and mind) which in fact were of different logical types. In order to combine things or to talk of their having cause or effect upon each other, those things must be of the same logical type. As an example of logically different types, Ryle offered, on the one hand, the University of Oxford, and, on the other, the actual college buildings which make up the university. To go looking for the university in addition to the buildings which compose it, is to assume that the university is another building. Ryle's point is that since the university is of a different logical type from its buildings, it is quite impossible to talk about one in the same way as one talks about

the other. If psychological states in the narrow sense and indexical meanings are of different logical types, then it is inappropriate to try to combine them and what Putnam's argument shows is just this. There is a suggestion that this is what Putnam might be doing where on page 221 (op.cit.) in talking about the adoption of the assumption of methodological solipsism he says: "But three centuries of failure of mentalistic psychology is tremendous evidence against this procedure, in my opinion."

If it is a category mistake to try to combine narrow psychological states and indexicals, but one still wishes to reject Putnam's view so trenchantly expressed in (1), what can be done? Assuming one accepts Putnam's two principles (I) and (II) and principle (III) which is a consequent of them - and for the moment, I shall - then the remaining alternatives seem to be to reject narrow psychological states, or indexical meanings, or both. Although there are certain difficulties with indexical meanings, I shall not pursue these here. The real problem, I contend, lies with narrow psychological states and it is this notion which must be rejected.

The implicit argument in Putnam against an alternative to narrow psychological states is along the following lines: If meanings are psychological states, then if Jane and Jill are to have the same meaning with respect to a particular term, say water, then Jane and Jill must have the same psychological state; however, if psychological states involve particulars then they

cannot have the same psychological state because in the one case it is Jane's psychological state and in the other Jill's. That Putnam subscribes to such a view is, I believe borne out by his remark on page 222 (op.cit), "Indeed, Frege's argument against psychologism is only an argument against identifying concepts with mental particulars, not with mental entities in general". Now in abstracting, we can abstract how we like, and there is no reason why in talking of psychological states we should not abstract from the possessors of those states but still allow the details of the environment in which those states exist, i.e. one is not interested in the fact that Jane or Jill has the psychological state, but one is interested in the fact that a psychological state, x has a relationship to or presupposes a particular, say Mount Everest. In such a case, x is the psychological state it is because of the existence of Mount Everest. Of course, such a possibility is a non-starter for the non-physicalist because psychological states and physical facts will, on Ryle's view, be of different logical kinds and cannot, therefore, interact. For a physicalist, a psychological state will be one or several physical states (there is no necessary one-to-one correspondence, of course), so talk of interaction with other physical phenomena is not out of place.

On such a view, Jane and Jill can both still have the same psychological state x even though x presupposes a particular, Mount Everest. It follows, therefore, that if meanings are

psychological states, then Jane and Jill can have the same meanings for terms. The fear that allowing particulars to enter into psychological states means the demise of public meaning is thus unnecessarily held. If particulars can enter into psychological states, then, I believe, Searle's argument against Putnam holds. Public meaning is in fact quite a complicated subject as we shall see in chapter 3.

I mentioned earlier that there seems to be good reason for doubting the truth of principle (II), i.e. that meaning in the sense of intension, determines extension. This might be demonstrated with a little fiction. Suppose that in an English text of 1750 we come across the word numpat. Now by pure bad luck, all other records which contained this word have been destroyed and the only information that the text contains about numpat is that a numpat is a kind of tree - which one, it does not say and, for the sake of example, we may assume we shall never know. We may, therefore, use the word numpat in, for example, such utterances as, "There were numpats around in 1750", but do we know the meaning of numpat? Clearly, if by knowing the meaning we mean being able to determine its extension, we do not, for we cannot distinguish numpat trees from other kinds of trees. Putnam's division of linguistic labour will be of no use here, because there is nobody extant who knows any more about numpats than you or I. But can we, therefore, be said to know the meaning of numpat? Intuitions here might vary, but I am inclined to say that we can. The reason I

incline to this view is that it seems to me that there are a great many words which many people use of which, to all intents and purposes under the normal reading of meaning, they appear to know the meaning. Such words refer to types of chemicals, trees, fish, etc. Many of the people using such words would not be able to determine the extension of the words. For example, in my vocabulary I have the word guppy. I think, I know the meaning of this word: it's a kind of fish; however, I could not pick out a guppy from other fish. I think that in ordinary parlance, it would be allowed that I know the meaning of the word guppy, but, if this is so, then knowing the meaning of a word is not necessarily co-extensive with knowing its extension and, therefore, meaning does not necessarily determine, or does not fully determine, extension. If knowing the meaning of a word is not necessarily the same as knowing its extension, then Putnam's principle (II) fails and so does the consequent, principle (III). It is to be noted that Putnam cannot repeat his argument based on knowing an extension rather than knowing a meaning because I do not claim to know the extension of the word guppy, only its meaning.

The suggestion that knowing the meaning of a word and knowing its extension are not necessarily co-extensive may seem unpalatable to some, but such a suggestion may be no more than a reflection of the fact that the connection between meaning and the world is more tenuous than we care to admit.

Putnam attempts to show that meanings cannot be in the head. Fodor argues that meaning, reference, truth, and any other of what he calls semantic notions, do not lie within the province of psychology; specifically, he says, "My point then, is OF COURSE not that solipsism is true; it's just that truth, reference and the rest of the semantic notions aren't psychological categories". (1981 : 253). Now my concern here is not with whether semantic notions are psychological categories or not, but rather with the implication that if they are not, then meanings are not somehow in the meaner, not somehow in the head. Let me say here without pre-empting the more careful formulation to be given later, that I take it that meanings are in the meaner in the sense that meaning is a relationship between two things internal to the meaner. The suggestion that is repeatedly made that meaning is a relationship between language and the world I take to be at best, a gross oversimplification, and at the worst, false. Yet in a more sophisticated form this seems to be Fodor's position, for example, "From the point of view of the representational theory of mind, this means that seeing involves relations between mental representations AND THEIR REFERENTS; hence semantic relations within the act". (op.cit.:228)

Semantics of this kind, Fodor calls natural psychology, and although he mentions (op.cit.:250) that there may be certain other kinds of semantics, he does not go into detail. Such a semantics (natural psychology, which is not part of psychology as usually construed), claims Fodor, requires the stating of

natural laws regarding stimuli and responses, and this requires a great deal of detailed work which will not be carried out in the foreseeable future. Fodor notes the connection of such a view with that of Bloomfield (1933) that semantics cannot be done without great advances in or even the completion of the physical sciences; and although he queries (op.cit. footnote 11 : 331) the point of so defining semantics that there cannot be any, by and large, he accepts Bloomfield's contention.

I wish to argue that, on Fodor's view, either there cannot be any semantics now or at any time in the future or Fodor has misconstrued what semantics is and annexed for his "syntax" what rightfully belongs to the domain of semantics. In support of this argument I shall draw on Fodor's own premisses as given in both his The Language of Thought (1975) and Representations (1981). Whilst his position on a language of thought does not seem to have changed in any fundamental respect between 1975 and 1981, there is a discernable shift regarding his view of semantics. In The Language of Thought, as I shall show later, Fodor views semantics as being at least partly based on meaning. In Representations, on the other hand, he seems to have swung wholly to a referentially based view of semantics. Since his view of semantics to which I take particular exception is contained in Representations, a refutation is called for.

Fodor's position in Representations is such that it leaves no room anywhere for semantics. Since I take it that it is desirable to have such a thing as semantics, Fodor must be wrong,

but wrong is his dichotomy of the semantic and the non-semantic, not necessarily wrong in the details of his model with which I have much sympathy. In Representations, Fodor is arguing for a psychology which adopts what he calls a computational theory of mind. Of computational, Fodor says this:

I take it that computational processes are both SYMBOLIC and FORMAL. They are symbolic because they are defined over representations, and they are formal because they apply to representations in virtue of (roughly) the SYNTAX of the representations... I'd better cash the parenthetical "roughly". To say that an operation is formal isn't the same as saying that it is syntactic since we could have formal processes defined over representations which don't, in any obvious sense, HAVE syntax. Rotating an image would be a timely example. What makes syntactic operations a species of formal operations is that being syntactic is a way of NOT being semantic. Formal operations are the ones that are specified without reference to such semantic properties of representations as, for example, truth, reference, and meaning. Since we don't know how to complete this list (since, that is, we don't know what semantic properties there are), I see no responsible way of saying what, in general, formality amounts to. The notion of formality will thus have to remain intuitive and metaphoric, at least for present purposes: formal operations apply in terms of the, as it were, shapes of the objects in their domains. (: 226, 227)

Fodor admits that he is not very clear (: 227, 228) about the formality condition, but seems to assume that this will become clearer. The question is, however, how can it given that (a) Fodor claims that semantics (as construed as natural psychology) can't be done; (b) Fodor has defined the formality condition in terms of the non-semantic; and (c) the only way to delimit semantics is to do some? Putting this to one side,

however, there are more serious problems with Fodor's view.

Although Fodor only speaks metaphorically about formal operations applying in terms of the shapes of its operands, this notion extended seems to me to give the only non-arbitrary definition of formal characteristics that one is likely to find and, in addition, this is the definition which underpins the traditional or usual notion of formal. The formal characteristics of something are its non-accidental properties, those properties without which it would not be what it is, in short, its intrinsic properties. Shape, size, mass, electrical and chemical properties of *x* are all formal characteristics of *x* on this view because they are all intrinsic properties of *x*. There will be other properties of *x*, its relation to other things, for example, but these will be accidental properties of *x*, not intrinsic ones: *x* would still be *x* if these relations changed. Any choosing of a subset of the intrinsic properties of *x* as being the set of its formal properties would be arbitrary since one intrinsic property of *x* is as good as another for its identification.³

Now Fodor explicitly makes a dichotomy between the formal on the one hand, and the semantic on the other. Hence, on the view

³ This is not to say that all intrinsic properties are equivalent for a particular formal operation, clearly they are not; but unless one could show that no formal operation could operate with a particular intrinsic property, then to dismiss that property as being non-formal would be arbitrary.

of formality taken above, the formal properties of an operand will be its intrinsic properties, whilst any semantic properties it has will be accidental ones. This dichotomy between formality and semantics parallels, as Fodor notes, that between syntax and semantics. The latter dichotomy is supposed to be perfectly clear but I shall suggest later on that this is not the case. Both formality and syntax are supposed to be concerned with the shape of their data (to call them symbols might be misleading) rather than with their interpretation or content. Syntactic rules and formal rules are supposed to operate only on the intrinsic properties of their data. So, for example, if the datum is a wooden cube then its being a cube or wood or of a certain size or colour will all be properties on which a formal or syntactic rule could operate, whereas its meaning "three red chickens" is not an intrinsic property of it, not part of its physics: it could just as well have meant something else or nothing at all. Whether, the cube has any non-formal properties in addition to its accidental relationships with other cubes seems, then, to depend in large part on whether it has any meaning, nonnatural meaning in the sense described in 1.0. The difficulty for Fodor stems from the fact that whereas the cube is endowed with meaning by and only has meaning for a meaner or meaners, one cannot say that of the operands in Fodor's computational-theory-of-mind approach because either that leads to an homonculus or an infinite regress. Fodor rejects the homonculus, naturally, and blocks the regress, but only at the

expense of being left with no possibility of having any semantic properties in his sense. To see why this is so, we need to turn to Fodor's The Language of Thought.

In The Language of Thought, Fodor argues "... that you cannot learn a language whose terms express semantic properties not expressed by the terms of some language you are already able to use". (: 61).⁴ Such a claim, thought of in terms of natural language, leads to a regress, since to learn a language one needs a language, but then to learn that language one needs a language, and so on ad infinitum. Fodor stops this regress by postulating an innate language of thought, one that may possibly be developed by combining predicates, but one nonetheless which does not have to be learned. The immediate questions that the postulation of such a language of thought leads to are: "What is a language of thought like?" and "Why is a language of thought the way it is rather than some other way?" Fodor gives a partial answer to the first question and a full answer to the second in an analogy that he makes with computers in The Language of Thought:

Real computers characteristically use at least two different languages: an input/output language in which they

⁴ Fodor does allow that in learning a language one may combine units of the language one already knows in ways that one has never done before. Hence "airplane" of the language one is learning may bring about a combination of "flying" and "machine" in the language one knows, but the point is that airplane just means "flying machine" (: 96).

communicate with their environment and a machine language in which they talk to themselves (i.e., in which they run their computations). 'Compilers' mediate between the two languages in effect by specifying biconditionals whose left-hand side is a formula in the input/output code and whose right-hand side is a formula in the machine code. Such biconditionals are, to all intents and purposes, representations of truth conditions for formulae in the input/output language, and the ability of the machine to use that language depends on the availability of those definitions. (All this is highly idealised, but it's close enough for present purposes.) My point is that, though the machine must have a compiler if it is to use the input/output language, it doesn't ALSO need a compiler for the machine language. What avoids an infinite regression of compilers is the fact that the machine is BUILT to use the machine language. Roughly, the machine language differs from the input/output language in that its formulae correspond directly to computationally relevant physical states and operations of the machine: The physics of the machine thus guarantees that the sequences of states and operations respect the semantic constraints on formulae in its internal language. What takes the place of a truth definition for the machine language is simply the engineering principles which guarantee this correspondence.

I shall presently return to this point in some detail. For the moment, suffice it to suggest that there are two ways in which it can come about that a device (including, presumably, a person) understands a predicate. In one case, the device has and employs a representation of the extension of the predicate, where the representation is itself given in some language that the device understands. In the second case, the device is so constructed that its use of the predicate (e.g. in computation) comport with the conditions that such a representation would specify. I want to say that the first is true of predicates in the natural languages people learn and the second of predicates in the internal language in which we think. (: 65, 66)

So for Fodor, a computer "understands" machine code because it is a straight representation of its own physical states, the intrinsic properties of parts of it. Likewise, a person understands a language of thought because it is a straight representation of

that person's physical states. A language of thought could not be other than it is because it is wedded to the brain which instantiates it. But how could a language of thought be so constrained, be a STRAIGHT representation of physical states unless it itself were a physical facet of the brain? And if it is a physical attribute of the brain, then it is an intrinsic property of the brain. Presumably, a person understands sensory input to the brain because a language of thought represents such input in a way that relates directly to physical states of the brain, i.e. it is a physical, and, therefore intrinsic, property of the brain that such and such input should be represented in a certain way and in no other way. Thus the connection between sensory input and representation is a straightforward physical one. But if this is so then there are in the terms discussed above no non-formal properties of a language of thought and therefore, no semantics in Fodor's sense of that term in Representations. Fodor's use of the term semantics in The Language of Thought is, as I shall briefly show shortly, much less clear and more equivocal.

Defining semantics as Fodor has done in Representations and adhering to his language of thought (and there is no suggestion that he has fundamentally changed his mind on this) commits Fodor to a world without semantics. If Fodor wishes to accommodate semantics, then he must allow that at least a subset of formal properties are semantic properties too. The formality criterion could not then, of course, by itself be used

to delineate the semantic from the non-semantic.

In the quotation from Representations given earlier, Fodor lists among semantic properties, meaning. This is, of course, only to be expected for what would semantics be without meaning? In The Language of Thought, Fodor uses the term message for what I can only conclude is meaning, where meaning is distinct from reference. Fodor talks of "...wave forms corresponding to given messages..." (: 111), of "...an adequate representation of a message..." (: 111), of messages as having to "...exhibit a systematic relation to structural descriptions..." (: 111), of messages as specifying "...the information communicated in verbal exchanges..." (: 111), and of the recovery of a message which "...constitutes understanding a sentence..." (: 114). From these several examples and others which could be cited, it seems reasonably clear that Fodor is using the term message where others would use the term meaning. Now what turns on this is that a little later, Fodor claims that "...messages must BE formulae in the language of thought..." (: 115). Is this just a slip of the pen or is Fodor really arguing that meanings (i.e. messages) are formulae in a language of thought? If it is not a mistake, then something very semantic, viz meaning, lies at the heart of Fodor's thesis. On page 122 there is some further evidence to suggest that there is no mistake, for there Fodor talks of "...internalized computational procedures which associate token messages with token sentences and vice versa." But within a few lines doubts are again raised when Fodor claims

that, "Messages must be so represented as to provide appropriate domains for the computations involved in encoding and decoding speech" (: 122). So, on the one hand, messages are formulae in a language of thought and, on the other hand, they are what is represented in the operands of internal computations. Fodor's choice of the word message instead of some restricted use of the term meaning and his apparent equivocation on whether a formulae of a language of thought is or just represents a message, gives an impression of an over all equivocation toward meaning and, therefore, semantics in general, in The Language of Thought.

Fodor is at some pains in The Language of Thought to defend what he called a translational theory of meaning from an attack made in general on such theories by Lewis (1972). While Fodor admits that a translational theory of meaning, i.e. one that gives the meaning of an object language in terms of a metalanguage, does not provide a theory of reference, he still feels that "...it would be plausible to think of a theory of meaning for a NATURAL language (like English) as a function which carries English sentences onto their representations in the putative internal code." (: 119). And while Fodor accepts that the "real" semantics being advocated by Lewis as he sees it has to be part of the theory of the internal code, he seems to feel that it comes as part and parcel of the internal code:

Moreover, if a 'real' semantic theory is one which says how formulae in the INTERNAL code relate to the world, then speaker/hearers do NOT have to learn any such a theory;

presumably the internal code is not learned but innately given. (: 122, footnote)

By the time of Representations⁵, however, translational semantics seems to be semantics no longer and Fodor appears to be advocating classical semantics which he associates with Frege, Tarski, Carnap, and contemporary model theory (: 204, footnote). The basis of such classical semantics is the notion of reference, and to overcome the difficulty of the lack of referents for many terms in a language (unicorns and golden mountain, for example) possible worlds of one kind or another are introduced. The difficulty is that if one is concerned with how meanings operate, the only place for possible worlds to be is in their heads and this seems to leave Fodor with some explaining to do. There appear to be two alternatives: (a) Fodor could claim that semantic theory proper deals only with the relation between the internal code and actual objects in the world. Such a claim would, of course, deny any prior place for meaning over reference and really amounts to just a particular theory of reference. Even this limited theory would not be possible unless, of course, Fodor allowed that some of his formal properties were "semantic" since, as the above quotation shows, Fodor believes the internal

⁵ One of the difficulties with Representations is that it is a series of articles rather than a concentrated development of one topic as is found in The Language of Thought. This makes it difficult to be sure that one is getting a clear view of Fodor's over all position.

code relates to the world because of the way it is: nothing is learned. (b) Accept that, after all, meaning is the key element in a semantic theory and that there seems little other choice than to make meaning essentially internal to the meaner and a pre-requirement for a theory of reference. If a semantic theory is to do the work one expects of it, then it will not do to abandon meaning; and however recalcitrant the notion of meaning is, some account of it must be given which accords with the way the world seems to be.

If the arguments against Putnam's position and Fodor's terminology are correct then this merely goes to show that one could do semantics and that meanings could be in the head: they do not show how one could do semantics or how meanings could be in the head. One may earnestly believe with Searle (1983 : 200) that meanings are in the head because there is nowhere else for them to be, but such a belief needs support. Such support can be given, I think, by giving an account of how meanings are in the head. The burden of this essay is to attempt to give just such an account.

1.2 Semantic Systems and Semantic Apparatus

I wish to draw a sharp distinction between semantic systems on the one hand and semantic apparatus on the other. Such a distinction, although perhaps uncommon (at least explicitly so) in semantics, is strongly paralleled by the distinction between

particular grammars and universal grammar in Chomskyan linguistics.

Just as English or French or Chinese has its own particular grammar⁶, so each has its own particular semantic system. If one wishes to say something quite general about grammars in the sense that x is a possible grammar but y is not, then one is putting a general constraint on the type of possible grammars. Such generalisations about grammars are called by Chomsky universal grammar. But such a universal grammar can only "control" particular grammars to the extent that it is inherent in individual users of particular grammars. Hence universal grammar exists in some form in all users of (natural language) grammar and as such amounts to a partial characterisation of those users. In parallel, if one wishes to say something general about semantic systems, one is claiming both that the possible systems are constrained and that there is something which operates such constraints. As with grammars, the most plausible place for this "something" to be is in the users of semantic systems. Such a "something" is a physical realisation of the semantic apparatus.

Chomsky restricts the notion of universal grammar to natural languages. My notion of semantic apparatus is not so

⁶ The term grammar is sometimes used in a narrow sense to exclude semantics and sometimes in a wider sense to include it. Chomsky, in general, uses it in the wider sense, but I ignore this complication here in order to bring out the parallels sharply.

restricted, but is intended to apply to all semantic systems⁷ wherever found. The description of the semantic apparatus, although given in abstract terms, attempts to use predicates which could be applied in biology, chemistry and physics. The description of universal grammar is not couched directly in such predicates, but Chomsky maintains its connection with biology: "Linguistic theory, the theory of UG [universal grammar], construed in the manner just outlined, is an innate property of the human mind. In principle, we should be able to account for it in terms of human biology." (1976 : 34)

The desire for full generality for the semantic apparatus stems from a felt need to attempt to produce some theory in which it makes sense to talk about meaning in cross-species terms. The term species here is intended to embrace machines and aliens as well as the normal and known biological species. The most pressing need comes, perhaps, from artificial intelligence where the requirement for some neutral description of meaning is great. The theory to be proposed is, it is hoped, a start in producing such a description.

The study of universal grammar is general linguistics. By analogy, I call the study of the semantic apparatus, general

⁷ A qualification concerning a criterion for the semantic apparatus will, in fact, be introduced later.

semantics, (The term general semantics used in this way⁸ will have little to do with the General Semantic Movement started by Korzybski's Science and Sanity (1933)).

1.3 Semantics and General Semantics

Somewhat paradoxically, the terms general linguistics and general semantics are narrower in meaning than are the respective terms, linguistics and semantics. In each case the former terms refer to a subpart of that which the latter terms refer to.

The notion of general semantics parallels that of general linguistics in other respects too. General semantics will restrict the range of possible semantic systems, but it will not predict their occurrence. Less obviously, but more importantly, perhaps, particular semantic systems might invoke more assumptions than does general semantics. For example, in dealing with the semantics of natural, human languages, there will be the additional assumptions that there are such things as humans, that humans have certain characteristics, that humans exist in a world of a particular type, and so on.

Just as the investigation of particular grammars is important for general linguistics, so the investigation of semantic systems is important for general semantics. If, for

⁸ There is a precedent for using the term general semantics in a non-Korzybskian way, cf. Lewis' "General Semantics" (1972).

example, something was to be found in a semantic system which was not "permitted" by the semantic apparatus, then this would be grounds for holding that the description of the semantic apparatus was wrong. It is not the case that all phenomena found in semantic systems are consequents of the semantic apparatus alone. Frequently, other assumptions will need to be added to derive such consequents, but such consequents cannot violate constraints imposed by the semantic apparatus itself. It is in this sense that the term permit is used above. This may be a stronger condition than Chomsky puts on his universal grammar since he seems to allow that other faculties of the mind, in particular, what he calls the conceptual faculty, may do some, but not all, of the work of the language faculty (cf. Chomsky 1980 : 56-57).

1.4 Ontology and Terminology

The general semantic theory to be proposed is a claim about ontology. (Despite protestations to the contrary all theories, being theories about something, involve claims about ontology in one sphere or another.) It is a conditional claim of the form: If there are meaners then there is such and such. Since it seems reasonably agreed that the antecedent is true, then, the theory claims, there is such and such. What the theory does is to give a description of the such and such, but the description given is partial, only those characteristics or

properties which the theory requires are described. This has the consequence that in applying the partial description of the theory one could find that it applied to a number of things which were quite different in nature except in the required respect. The situation may be likened to the case of the instruction: "Stir with a wooden stick". Now in any actual stirring one will be using a stick made of a particular timber which may have very different properties to a stick made of another timber, but these other properties are not important for the instruction. Perhaps, so much is well understood, but it has important consequences which in view of the generality of the proposed theory are worth spelling out.

A general semantic theory is intended to be entirely general⁹, applying to meaners wherever they are found, be they animal, human animal, alien, or machine. As such, meaners might turn out to be composed of very different things. Aliens might have silicon chemistry instead of carbon chemistry. Meaning machines might function electronically instead of electro-chemically, as humans appear to do. Such differences could be allowable in the theory since such differences might involve properties not characterised in any way by the theory. Such properties will in fact be non-semantic properties.

⁹ In fact, in the next chapter, a criterion will be applied which limits the generality of the theory. This will not, however, affect the substance of what is being claimed here.

In order to talk about what exists (as far as the theory is concerned), the theory must use language, and for economy and convenience names are used most of the time instead of description. These names are the terminology of theory. The theory to be proposed has a considerable terminology and, like most terminology, it is tedious to acquire. However, the conciseness, clarity, economy, and convenience of using terms instead of descriptions is such, I hope, as to make the effort of acquiring the terminology well worthwhile.

The terminology of the theory will be introduced as the theory is developed; however, I think that it would be useful, if somewhat daunting, to the reader to have the majority of this terminology collected in one place, and I have, therefore, given an alphabetical listing in the appendix. This will provide a lexicon to which the reader can refer, and is urged to refer, as necessary. Much of the terminology is novel to avoid the unwanted connotations of traditional terms; however, there are three terms which have extensive use which may be felt to strongly invoke the ghosts of their former and other uses. These terms are associator, associate, and association, and at least the latter two have been and are used in connection with associationism. General semantics should, I believe, be neutral with respect to associationism, and although it is in some ways unfortunate that there are no more suitable terms available,

a short digression¹⁰ to consider the essential features of associationism will demonstrate that the use of the above terms does not impugn this neutrality, whilst forearming the reader against importing unintended and rejected connotations into my use of the terms.

Long before the emergence of the independent discipline of psychology, associationism was a position in philosophy with respect to the formation of complex ideas from more basic elements, such as simple ideas, sensations, images. Complex ideas were held to come about by association, and this is one of the two central theses of associationism. The other thesis is that association of simpler mental elements into more complex ones is governed by principles. The object of associationism was then, in fact, to establish just these principles. It is to be noted that strict associationism implicitly denies any purposive activity in the process of association. The reason for this is not hard to see: if one allows purpose to enter the picture, then the principles of association would be principles no more for the simple reason that purpose implies something doing the purposing and the whole point of associationism was to explain away the homunculus - the little man inside one's head who does the seeing, hearing, purposing, etc. and requires, of course, a little man inside his

¹⁰ I am largely indebted to Marx & Hillix (1963), Neel (1971), and Wolman (1960) for the following account of associationism.

head to do the same, and so on ad infinitum - not to co-exist with it. From a strict associationism point of view, the principles of association are intended to be a complete explanation of how associations come about. In such a scheme, the mind is purely passive, obeying mechanically the principles of association in arriving at complex ideas.

The history of associationism is a long one, and one can most readily get a flavour of the subject by considering three principles of association proposed by Aristotle.

1. Similarity Ideas will be associated if they are similar in some respect. So, for example, the ideas of fire and the sunset will be associated because of their similarity of colour.
2. Contrast Two ideas which oppose each other will be associated. Hence, for example, the idea of up will be associated with the idea of down.
3. Contiguity Ideas which are contiguous in time or space will be associated. So, for example, the idea of a whistle followed by the idea of a train will be associated with one another.

Of course, many difficulties arise in connection with these principles of associationism. For example, how contiguous do ideas have to be to be associated? Does one idea have to follow the other immediately, or can there be a gap in time, and if so

how long? More problematic, if two principles of association equally apply, say contrast and contiguity, which has priority?

In the model of general semantics which I shall be developing in the ensuing chapters, the associator is the person or thing in which associations take place. I shall offer no suggestions as to why some associations rather than others occur: it is sufficient for the model that certain associations can occur and the why of particular occurrences can be safely ignored. Associationism can be seen as an attempt to explain the why of associations, and since general semantics as perceived here does not attempt and need not attempt to explain the same phenomenon it remains impartial with respect to the rightness or wrongness of associationism.

2. The Lonely Meaner

2.0 Meaning Communities and the Lonely Meaner.

I have assumed thus far that what makes a meaner a meaner will turn out to be something intrinsic to individual meaners, but one answer to the question: "What makes a meaner a meaner?" might be that a meaner is a meaner because he/she/it is part of a meaning community, i.e. meaning is a purely social occurrence which arises, and only ever arises, in a society. Such a view will entail one or other of the following positions.

- (a) Individuals of a meaning community have a potentiality for being meaners which can only be realised in a meaning community. Such a potentiality is present in individual would-be meaners in the form of properties or equipment, which can only be activated in a meaning community.
- (b) Individuals of a meaning community have only a potentiality for being meaners in the sense that they have a potentiality for being members of a meaning community. There is nothing about individual members considered alone which tells us anything about meaning.

Despite the apparent implausibility of (b), I know of no a priori way of showing it to be false. The main argument against it is, I believe, methodological. Adopting position (b), one has to say that meaning can only be found in meaning communities (not, of course, in all communities, however constituted), and that no features of the individuals of a meaning community are relevant to its being a meaning community. On such a view, meaning is a truly emergent property¹ and by definition is therefore beyond all attempts at explanation. The most that could be said is that meaning is a property of some communities. Looking for and failing to find explanations of meaning will provide some evidence in support of position (b) and, indeed, perhaps this is the only way to find evidence in support of this kind of position. From a methodological point of view, it would seem, therefore, that concentrating on position (a) provides both the best prospect for showing position (b) to be false and the best (only?) prospect for showing it to be true. I shall from now on assume that assuming position (b) to be false is a reasonable methodological strategy to adopt.

Position (a) is rather different in that individual meaners do have equipment which they use in a meaning community for

¹ A truly emergent property is one that lacks causation and, therefore, cannot be predicted. See, for example, article on emergent evolutionism in Edwards, ed. The Encyclopedia of Philosophy (1967). Note that if causation was involved, then there would be something about the individuals of a meaning community that contributed to there being meaning, i.e. position (a) would be correct in some sense.

meaning, but such equipment cannot be used or activated by a meaner alone. Position (a) would be falsified by the discovery of a lone meaner, but the practical problems are very great. First, the lone meaner would have to survive away from his/her/its community (there are cases, however, where children have been claimed to have been brought up by wolves), and, second, one would have to discover that such an individual was a meaner without the discovery being the means by which the individual's meaning apparatus actually came to be activated.

It should be clear that position (a) is not the claim that the semantic system employed by a lone meaner would be very impoverished in comparison to those used in a meaning community. Such a claim would, I think, be the subject of wide agreement and I do not demur from it. The claim of position (a) is rather that there could not be a lonely meaner, however impoverished the semantic system utilised.

There are, in fact, arguments of considerable prominence against the possibility of a lonely meaner and these are to be found in arguments against private language. In order to see how arguments against private language bear specifically against the possibility of a lonely meaner, it will be necessary to defer discussion of the private language problem until after a model of a lonely meaner has been presented. I shall in the meantime, however, assume the conclusion of that discussion, viz. that the arguments against the possibility of a private language and, therefore, against the possibility of a lonely meaner are inconclusive.

There is plausible reasoning, I believe, for why a consideration of the meaning mechanism should begin with a single meaner, i.e. a lonely meaner. Let us suppose a world, W , in which there are just two items: a tree, which I call T and the sound of the word tree, which I call ST . (The unreality of W , for example, the fact that a sound needs something through which it is propagated, is not an argument against the claim to be made here since given time and space W could be fleshed out with all the consequential paraphernalia of a tree and a sound, but such additional assumptions would not alter the substance of the claim being made in any way at all). In describing such a world, one might describe the causal interactions of T and ST , such as they are. Let us call the set of such causal interactions CI_1 . CI_1 will, of course, contain only direct causal interactions since there is nothing else in the world under consideration. Nothing in CI_1 will correspond to ST meaning T or T meaning ST or T being the referent of ST or vice versa. Notice here that the conventions referred to in the introduction cannot be used because W does not contain any names, but only the items T and ST . In saying that meaning and referring are not among the relations in CI_1 , I take it that I am not saying anything controversial. The relations of meaning and referring only arise when a meaner is present. The claim is, although it could only be substantiated once a theory of a meaner had been worked out, that neither T nor ST is a meaner; therefore, there are no relations of meaning (in the sense of meaning outlined in 1.0) nor of referring in W .

To W, a meaner, A, is now added. We may suppose that A has sensory apparatus, like eyes and ears, and that along with A we add to W such things as light and air in order that A may use such sensory apparatus (the details are very unimportant). T and ST will have a causal effect on A, and because by supposition A is a meaner, ST could come to mean "T" for A and have as its referent, T. If one now looks at the set of direct causal interactions, CI_2 , between T and ST in this augmented world, will it be the same as CI_1 ? The answer, I think, that one would normally give is Yes. We do not expect and have no reason to believe that tree meaning "tree" alters the direct causal relationship between the sound of the word tree and trees. The relations of meaning and referring between T and ST are not, therefore, to be found in CI_2 , but, nonetheless, for A there are such relations between T and ST and since they are not in CI_2 they must be in A; however, ST and T are not in A, so the relationships of meaning and referring cannot hold between ST and T, rather they must hold between states of or in A caused by T and ST. Thus the relationships of meaning and referring which apparently hold between ST and T are in fact relationships which hold between two things, call them TI and STI, internal to A. But if this is the case, then one can talk about the meaning mechanism independently of objects external to A, for in general terms in describing the phenomenon of meaning it matters not whether TI or STI are caused by trees and sounds or trains and trams or even by the tinkering of some Cartesian demon: what matters is the relations that can come to hold between them. Hence,



one can remove from W, T and ST and even the sensory apparatus of A and still be left with a meaner, a lonely meaner.

Viewing the meaning relation as a phenomenon internal to the meaner is not, of course, at all new.² Saussure was quite explicit on this point: "The linguistic sign unites, not a thing and a name, but a concept and a sound-image." (1916, English Edition, 1960: 66). It is to be noted that Saussure speaks of a sound-image and not of a sound. A sound-image is internal to the speaker/hearer, a sound is not. Less explicit on the internal relation, but still very much on the same line of reasoning is Ogden and Richards' meaning triangle, which is reproduced in Figure 2.0.0.

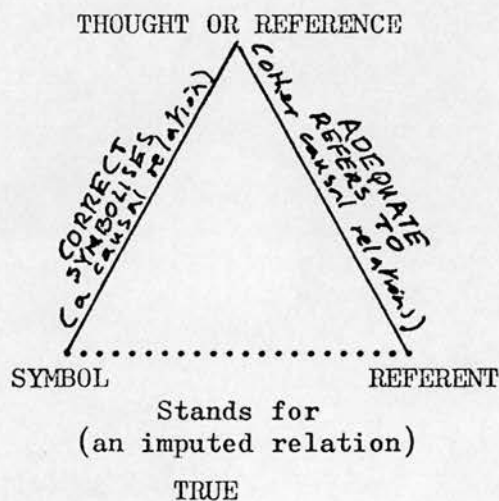


Figure 2.0.0 Ogden & Richards' meaning triangle from
The Meaning of Meaning (1923, Tenth edition 1949 : 11)

² Cf. Ullman (1962) where other references will be found and where some traditional criticisms of such an approach are briefly reviewed.

For Ogden and Richards, the thought or reference is an indistinguishable whole, but on the relation between symbol and referent (ST and T in W) they have this to say:

Between the symbol and the referent there is no relevant relation other than the indirect one, which consists in its being used by someone to stand for a referent.
(Op. cit. tenth edition: 11).

Neither Saussure nor Ogden and Richards pursue the nature of the internal relation of meaning directly, all, apparently, preferring the route via a "thorough-going investigation of language". (Ogden and Richards, op cit.: 14). A thorough-going investigation of language is a worthwhile goal, but however long and deep the study of language, this will not by itself bridge the gap between the observable language behaviour of meaners and the underlying and concealed means by which they use language to mean. To bridge that gap, one must attempt a theory of how meaners are able to mean.

In this chapter, I shall be concerned with the lonely meaner. In later chapters, the world, W, of the lonely meaner will be enriched, so that an account can be given of public language and public meaning and, hence, of meaning communities.

2.1 An Outline of a Model of the Lonely Meaner

In proposing a model or theory of the lonely meaner I shall be giving a description of the abstract semantic apparatus. The claim will then be that an actual lonely meaner or any meaner must possess a physical realisation of such an apparatus

otherwise it would not be a meaner. The semantic apparatus described is abstract in the sense that the description given is only concerned with semantically relevant details. In any realisation of the apparatus many other properties (what I called earlier, comcomitant properties) will be apparent. For example, if the semantic apparatus could be and was realised in some electronic machine, then all the properties of that machine and of all its parts would be comcomitant properties of the semantic properties realised in the machine. I stress this point because in considering a model of the lonely meaner I shall be interested only in the abstract semantic apparatus, and in outlining this I make no claims as to what would be necessary to maintain any particular physical realisation of the semantic apparatus.

Before attempting a description of the semantic apparatus, it is necessary to consider what criterion or criteria it must meet, i.e. what type or types of semantic systems it must be able to handle, for while it may be the case that I as a human being can conceive of no more powerful apparatus than one which can handle the semantic systems of natural language, there seems to be a distinct possibility that semantic apparatus of lower power could be conceived of. The criterion adopted here and to be understood as applying throughout the text unless otherwise specified is that the semantic apparatus must be of sufficient power to handle all natural-language semantic systems. This is both a useful and a convenient criterion. It is useful in

the sense that of prime interest are the semantic systems utilised by humans; it is convenient in the sense that the only real data available on semantic systems are data concerning human semantic systems.

In section 2.0, it was claimed that it seemed reasonably plausible to believe that the meaning relation, whatever it is, was internal to the meaner. In particular, the situation sketched was a world, W, containing just three objects: a meaner, A, a tree, T, and the sound of the word tree, ST. In such a situation, if ST came to mean "T" for A then, since there seems no plausibility in the suggestion that the direct relationships between ST and T have changed, one concludes that the relationship must be internal to A. ST and T are not, of course, in A, so whatever the relation of meaning holds between it must be something other than ST and T. These something elses I called TI and STI, and the thought was that TI and STI were states of or in A which were caused respectively by T and ST. Finally, I said that one could abstract away from what caused TI and STI and just deal with meaning as a matter wholly internal to A.

The last move might appear to go too far, an objection being that T and ST as causers of TI and STI are intrinsic to TI and STI being what they are, i.e. if there were no T and ST, then TI and STI would never occur. I do not think that this objection carries a great deal of weight. Such an objection amounts to claiming that experience of something or at least the

first experience of that something is always veridical. Hallucinations are, I think, sufficient to show that this claim is wrong, since once one admits the possibility of hallucination, then one has admitted the possibility of experience without the inferred cause of that experience.

The assumption is, then, that meaning is a relation within a meaner and that the entities that relation relates are also within the meaner. To make a start on the ontology of the model of the lonely meaner, it is necessary to give some description of what it is within the meaner that can be related, i.e. the semantically relevant features of TI and STI must be described. The semantically relevant features required here are not the specific semantic features which would be of interest in describing a semantic system, for example, the fact that the English word man has as some of its meaning components³ or features "male" and "adult"; rather, the concern is with those features or properties which make the apparatus a semantic apparatus rather than something else and which underlie the generalisations that can be made about semantic systems.

In describing TI and STI, one wants to be as economical

³ There has been a considerable amount of work carried out on the idea that the meaning of language items consists of a set of semantic components or features drawn from a pool of such components or features. See Katz 1972 and Leech 1974 for examples of two somewhat different approaches, and Biggs 1982, Kempson 1977, Lyons 1968, 1977 for some general criticisms of componential semantics.

as possible and, at the same time, account for certain semantic properties which they exhibit. The major semantically important properties which objects such as TI and STI exhibit is that of being similar and of being different. Similarity and difference, as will be seen later, underlie all the sense relations and analyticity. To see clearly what is meant by similarity and difference in the context they are being used in here, consider again the world, W, consisting of the three objects A, T, and ST. To W is added a bush, B, and the sound of the word bush (SB). In such a situation, SB could come to mean "B" for A, and the relevant objects internal to A will then be SBI and BI. Now trees and bushes have quite a lot in common, i.e. they are similar in certain respects, but also different in certain respects. TI and BI will therefore have a certain similarity as well as a certain difference. The question is: "How can this be explained?" To say merely that TI and BI are similar in certain respects is not to offer any explanation at all. The notion of similarity remains utterly mysterious.

The notion of similarity can be fully explained, I believe, if one considers TI and BT to be complex, made up of subcomponents. TI and BI will then be similar to the extent that they contain the same subcomponents, and different to the extent that they contain different subcomponents. As simple as this proposal sounds, it will give the model considerable explanatory power in the area of sense relations and analyticity.

If TI and BI are in fact complex, then what the model should

describe are not these complexes but, rather, the basic building blocks out of which these complexes are made and the operations by which they are constructed. The basic building blocks will be called discriminators and their formal specification is given in (1). I am attempting here to introduce the components of the semantic apparatus in an explanatory way. Since, however, the formal specifications are constructed from a logical perspective of the whole semantic apparatus, they often contain terms which have not thus far been introduced. (1), for example, contains the novel terms associator and focal. Such terms will be considered in due course, and the reader is asked not to worry over them until they are considered.

- (1) Discriminator (d): A "bit" of and within an associator which is distinct in respects other than spatio-temporal ones and which may be associated with focals, but no proper subpart of which can be independently associated with a focal.

What (1) says is that a discriminator is a part of an associator and that it is distinct not merely by being in one position rather than another but intrinsically so. Further, a discriminator is not a complex in the sense that parts of it can be separately associated with a focal - the whole discriminator has to be associated or not associated.

A discriminator is the basic building block out of which objects like TI and BI are made. This does not mean, however, that discriminators are not complex in their own right. They may in fact be of any order of complexity whatsoever. Whether they are simple or very complex will depend on the job they do and their physical realisation. Discriminators are only basic in the sense described, viz. that they come as a whole and cannot be broken up for regrouping in other complexes involving focals.

This view of discriminators carefully avoids taking a discriminator to be necessarily a single unit and, hence, avoids a problem in brain science which Dennett (1978) has termed the grandmother-neuron problem. Dennett expresses this problem as follows:

Many otherwise plausible theory sketches in brain science seem to lead ineluctably to the view that the "representation" of each particular "concept" or "idea" will be the responsibility of a particular neuron or other small part of the brain. Suppose your "grandmother neuron" died; not only could you not SAY "grandmother", you couldn't SEE her if she was standing right in front of you. You couldn't THINK about grandmothers at all; you would have a complete cognitive blind spot. Nothing remotely like that pathology is observed, of course, and neurons malfunction or die with depressing regularity, so for these and other reasons, theories that require grandmother neurons are in trouble. (: XIII)

If discriminators were characterised as single atomic units, then the grandmother-neuron argument could be used against them; however, no such stipulation is made or needs to be made: the number of one kind of discriminator may vary greatly and all that

is required is that however many there are they are indistinguishable in the way they operate.

Additionally, it needs to be observed that Dennett over-emphasises the argument against grandmother neurons, for whilst pathologies of the kind he describes do not seem to be observed, pathologies that are REMOTELY similar, like, for example, being colour blind, are regularly observed.

The name discriminator is intended to be indicative of the fact that a discriminator is the smallest unit which is available for interacting with the environment and being available to build into complexes. Discriminators, however, should not be thought of like the cone or rod receptors of the retina. There is no presumption that they are the direct detectors of external causation. It is quite likely that between discriminators and external causal influences there is a great deal of sensory machinery. Further, some discriminators might be the recipients of internal causal influences generated by other parts of the semantic apparatus.

So far, I have talked about TI and STI as being states caused by T and ST, and of being objects independent of T and ST, and of being composed of discriminators which like TI and STI may themselves be the subject of internal and external causal influences. With such loose talk, the notions of TI and STI must be in danger of losing their coherence or, rather, of not having any in the first place. The excuse for such a loose way of talking is that in trying to get some grasp

on the theoretical notions one uses any ammunition to hand, but a reckoning must come and unless a somewhat more precise pre-theoretical conception of TI, STI, and discriminators can be given the theoretical concept expressed in (1) will be muddled rather than clarified.

A discriminator in its realisation will be a piece or pieces of physical matter, simple or complex in structure, and perhaps interwoven with other physical matter which is not part of it. Being a piece of physical matter, a realised discriminator can enter into causal interactions with other pieces of physical matter. The realised discriminator will change state according to causal influences, but it is always in some state or other. Associations between discriminators are not associations between states, but associations between the physical loci of the states. An analogy might make this clearer. Suppose one considers a light bulb connected to a power source through a dimmer switch. Such a light bulb can be in a large number of states: it can be off, on very dimly, on very brightly, and so on. It is always in one state or the other and to identify it as the same light bulb we need some constant which does not change, such as location. Suppose now that one wishes to hang a lamp shade on the bulb, it is not the case that one hangs it on a state of the bulb, rather one hangs it on the bulb even though the bulb is always in one state or another (off, dim, bright, etc.). So it is with discriminators. A discriminator is always in one state or another, but in talking about discriminators

per se the talk is neutral as to the state of the discriminator.

Since TI and STI are made up of discriminators (in a way to be discussed shortly), it was an imprecise way of talking earlier when I said that they were states; rather they are what is in those states, even though as with the light bulb one could not separate the thing from its being in some state or other.

TI and STI are, then, complexes of discriminators. The model needs to specify how, but not why, such complexes arise. The basic operation in the model will be that of association, formally specified in (2).

- (2) Associate/
Association To connect in some manner so that access
to one item in the association gives access
to all the others in that association.
Each use of an associative link is
distinctive and ordered.

The notion of access as used in (2) is realisation-dependent. In the case of a realisation in chemical terms it might mean the possibility of a chemical reagent moving from one item to another; in electrical terms it might mean the possibility of an electrical current passing from one item to another.

The complexes of discriminators which constitute TI and STI are, therefore, to be constructed by associating discriminators, but it will not do to associate them in just any old way because

this will introduce hidden structure into the model. This can be seen in figure 2.1.0, where four discriminators are indicated by the notation d_1 , d_2 , d_3 , d_4 , and the associative links between them are shown by lines. Whichever discriminator one starts with one enters a different configuration of associations, and such configurations amount to structure.

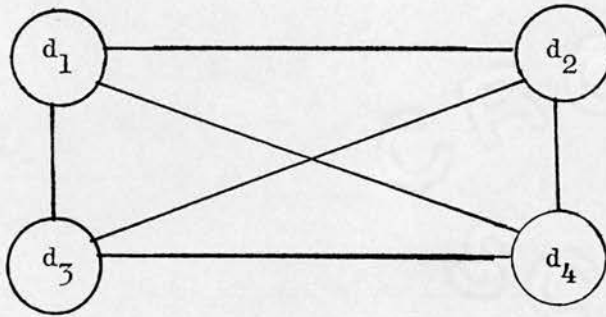


Figure 2.1.0

It is not the case that one does not want structure in the model; quite the reverse. But any structure specified in the model must have a precise function, and the complexities of structures generated by a process of association, as depicted in figure 2.1.0, seem to be far richer than those required in the model and beyond any straightforward specification. What is needed is a way of associating discriminators which, although it yields a structure, yields a neutral one. This could be achieved if instead of a discriminator associating directly with another, it associated with a neutral element which in turn was associated with another discriminator. The starting point for accessing a group of discriminators associated in such a way would then be

this neutral element, and from that point the structural configuration of the discriminators is completely uniform since it is not possible to get from any one discriminator to another except via the neutral element, as figure 2.1.1 shows. The neutral element is rather like a junction box, mediating the associations between discriminators, and for obvious reasons I call it a focal. Formally, a focal is as specified in (3).

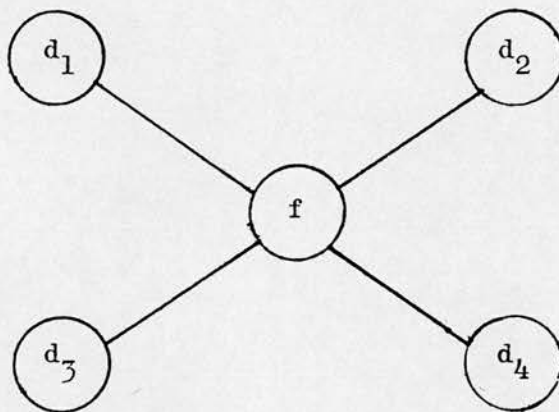


Figure 2.1.1

- (3) Focal (f) A "bit" of and within an associator which is not necessarily distinct in respects other than spatio-temporal ones and which may be associated with discriminators and other focals, but no proper subpart of which can be independently so associated.

It is of no concern in the model that focals be intrinsically distinct; like junction boxes, they are required to be all the

same or very similar. Once they are associated with discriminators, they will become distinct because their associated discriminators are distinct.

It is useful to have a name for complexes of associated discriminators like that in figure 2.1.1 and I use the name collect. The formal specification of a collect is as in (4).

- (4) Collect (c) An association of one or more discriminators with a focal or an association of one or more collects with others.

Collects, in fact, can turn out to be quite complex things and involve structure, but for simplicity and ease I shall assume that the collects which are TI and STI are simple ones like those shown in figure 2.1.2.

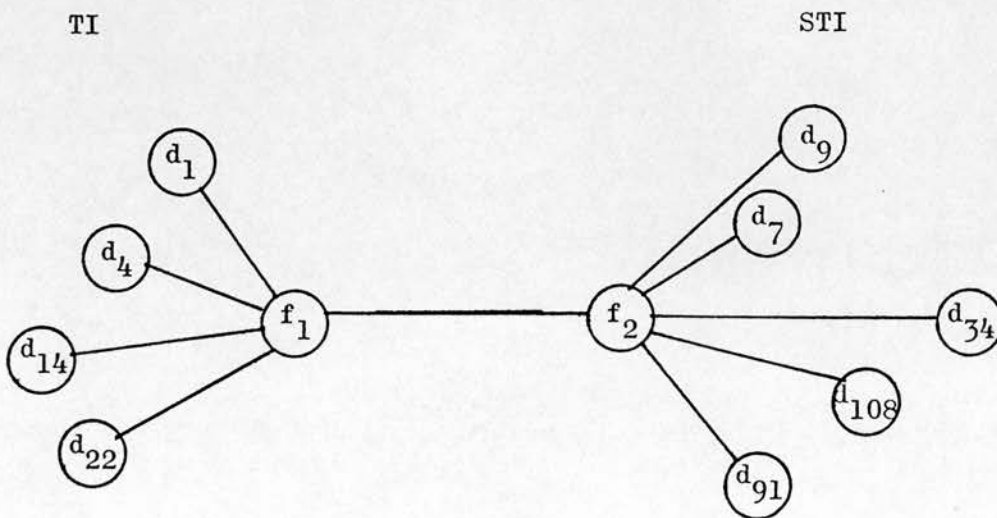


Figure 2.1.2

The assumption here is that TI and STI are not at all similar, therefore, they do not share any discriminators.

An associative link is shown between TI and STI in figure 2.1.2, can this be used to indicate the meaning relation? Clearly not as matters stand because TI and STI are precisely the same kind of objects. TI does not mean STI and STI does not mean TI. In fact, TI and STI as shown in figure 2.1.2 do not mean anything at all. Nonetheless, the assumption has been that in A a meaning relationship holds between STI and TI, i.e. one is going to have to say, if this approach is correct, that STI means TI in A, and that TI is the meaning of STI for A. What characteristics would TI or STI need for such a relationship to hold? If the words red book are uttered it is the case in normal circumstances that one pays no attention whatsoever to the sounds of the words, but only to their meaning. It is as though once the sounds had been recognised⁴, attention is switched straight through to the meanings of the words. This is the essential feature of all signs: they point to something else and, in so doing, away from their other properties. If STI is going to have meaning in the required sense, therefore, it must act in the same way as a sign, it must point away from itself and towards TI. Clearly if STI is to have this property

⁴ I am not implying here that recognising the sounds of words as the sounds of words is a straightforward matter. Indeed it is very complex and may involve the meanings of some words in order to decipher the sounds of others.

and TI is not then they cannot be the same kind of objects. STI needs the property of being a sign of something else. This property, or rather what possesses or brings it to a collect, I call a sign-marker, a formal definition of which is in (5).

- (5) Sign-marker (SM) A distinguished discriminator or collect associated with a collect to indicate and effect that that collect be taken as a sub.

In constructing the model, one is not concerned with the particular physical realisation of its contents - although should it turn out that some item of the model is not a plausible candidate for any physical realisation, this would be good reason to revise the model; however, it is often helpful to consider in a very approximate way the physical counterpart to the formal object of the model. Such is perhaps the case with the sign-marker. The sign-marker can be thought of rather like a switching mechanism in that once associated with STI, whenever a signal, say, arrives at STI it is immediately switched along the associative link to TI. When STI is associated with the sign-marker, then, it acts like a sign. However, since the word sign is used of signs external to A, such as ST or SB, a different name for a collect associated with the sign-marker will be employed, viz. sub. To distinguish a collect which is not associated with the sign-marker, one can simply call it a

non-sub. Formally, one has:

- (6) Sub (s) A collect associated with the sign-marker.
- (7) Non-sub (ns) A collect which is not a sub.

Most talk of collects will in fact be talk about subs or non-subs, so the terms sub and non-sub are important terms in understanding the model being developed.

The meaning relation, then, as characterised by the model is a sub, s, being associated with a non-sub, ns. We shall then say that s means ns and ns is the meaning of s. Although one has an object, viz, ns, as the meaning of s, one cannot speak of non-subs in general as being meanings: they only become meanings when associated with a sub. This is why it makes sense to talk of meanings arising or obtaining in a particular meaner. There is no object one can hold up out of the context of a meaner and say that this object is meaning. A non-sub becomes a meaning in the context of a particular meaner; out of that context it is not a meaning.

All this is quite abstract and a firmer grasp of what is going on might be had by embedding the notions discussed so far in a natural language context. This will be a little rough and ready and it will involve a few notions not yet introduced, but it will serve its purpose if it makes the picture a little clearer. The claim so far is that inside meaners there are elements which I have called discriminators. These

discriminators may be associated together via focals into collects. There is a particular discriminator or collect which has the effect when associated with a collect, c , of making that collect act like a sign pointing to something else. This something else can be another collect, c_1 , with which c is associated. In such a case, I say that c means c_1 , c being a sub and c_1 a non-sub.

Now in the case of a natural language meaner, subs will usually correspond to elements of the language of that meaner. Indirectly, mediated by other organs, the sound waves which make up elements of the language will stimulate the subs of the meaner. It just happens, of course, that most natural languages are sound based, but the signs of a language could just as well, though not with the same practicality, be light patterns on a pond or clothes on a washing line. Subs, then, if one likes, are the internal elements in the meaner corresponding to the external signs, the sound waves or ink marks, of language, and linked to them by an indirect but nonetheless causal connection.

Non-subs, which may be the meaning of subs, too may be stimulated directly by objects external to the meaner. Hence it is possible that for a meaner, A, the non-sub, ns , which is indirectly stimulated by a tree might become associated with and, therefore, become the meaning of, a sub, s , which is indirectly stimulated by the sound of the word tree. Hence, for A, s will mean ns , and correspondingly tree will mean "tree".

It will now be apparent that quite a lot of associating

goes on in this model. For this reason, I call the something in which all the other "bits" of the model are to be found and where the associating goes on the associator, formally specified as in (8).

- (8) Associator (A) Someone or something in which discriminators
may be associated with focals, collects
with collects via focals and markers
with collects.

For the obvious reason of not wanting to beg the question, the term meaner does not appear in the formal description of the model, and from now on the term associator will be used frequently to stand for and locate the semantic apparatus.

It may be asked whether the use of the term associator begs the question of what constitutes a meaner any less, or significantly less, than the use of the term meaner itself. The answer is, I believe, that the use of the term associator does not beg the question at all providing that one sees clearly the question that general semantics attempts to answer. In posing questions about the general nature of meaners, one must sharply distinguish two questions:

- (a) How is it that meaners are able to mean? Specifically,
how is it that x is able to mean y for a meaner?

- (b) Why do meaners mean? Specifically, why is it that x came to mean y for a meaner?

The use of variables x and y in (a) and (b) is somewhat vague. In terms of the theory developed so far, the variable x would range over subs and the variable y over non-subs. However, questions (a) and (b) are intended to be pre-theoretical questions, so the notions of sub and non-sub cannot really be introduced into them. Approximately, x ranges over signs and y over their meanings, but, of course, a sign will be something which has a meaning and since, pretheoretically, the nature of meanings is vague, the nature of what it is that the variables x and y range over will be equally vague⁵. Such pretheoretic vagueness is only to be expected if it is the case that precision comes only with a theory.

Here, I am concerned with attempting to answer question (a), and not with attempting to answer question (b). In terms of the model developed so far, (b) type questions amount to asking why the sign-marker was associated with STI and why STI was associated with TI and even, indeed, why the discriminators which compose STI and TI were ever associated together in the first place. Although no general answers to such questions will be attempted, occasionally, granted a particular environment, suggestions will be made concerning partial answers to some aspects of these questions.

⁵ Cf. Grice's use of the variables x and something in "Meaning", 1957.

The notion of an associator would only be question-begging if one were trying to answer question (b), but since no general attempt is being made to do that, the term associator may be used freely without implying that the question of what guides the workings of the associator in making one association rather than another is being answered by the proposed model. In attempting to answer the question of how it is that a meaner means, it is hoped and expected that the nature of what would be required in the way of an answer to why it is that a meaner means will become clearer.

So far, the type of meaning that the model depicts is all non-structural. This follows from the fact that it has been assumed that discriminators can only be associated in a structurally neutral way. A great deal of meaning, however, involves structure. Not only is this true of sentences, but also of many single words. By the term structure here is meant the relationships which hold between smaller bits of meaning which are themselves structurally neutral. Structure may be exemplified by considering the world, W, again. Suppose to W an ordinary cat, C, and an ordinary dog, D, are added. Being an ordinary cat and an ordinary dog, they chase each other, and so in W one has the event of the dog chasing the cat, call this DChC, and the event of the cat chasing the dog, call this CChD. To W are also added the sounds of the words cat, SC, dog, SD, chase, SCh and of the utterances Dog chases cat, SDChC, and Cat chases dog, SCChD. The internal correlates in

A of these animals, sounds and events one may suppose to be CI, DI, ChI, SCI, SDI, SchI, DChCI, SCChDI, DChCI, and CChDI. Suppose further that SCI comes to mean CI for A and SDI comes to mean DI for A, and so on in the usual way so that the sounds of the English words and sentences have their usual meanings for A. Now the meanings of SDChCI (Dog chases cat) and SCChDI (Cat chases dog) for A will be DChCI ("Dog chases cat") and CChDI ("Cat chases dog") respectively, but if DChCI and CChDI are different, and by supposition they are, then there are only two ways in which this can be accounted for: either they contain different discriminators or they contain the same discriminators arranged in different structural patterns. The first alternative is to be rejected on grounds of economy and plausibility. If events like dog chasing cat or cat chasing dog were to be distinguished as wholes, i.e. they corresponded simply to one complex discriminator and had nothing in common as far as discrimination was concerned with cats and dogs and chasing in other circumstances, then there would be a vast explosion of the number of discriminators needed in the realisation of the model. Coupled with this consideration of economy is one of plausibility. If such events were discriminated as a whole then there could be no discernment of cat or dog objects as objects or individuals in such events and hence whatever was going on in these events would have no relationship whatsoever with the objects or individuals discriminated outside of such events. This seems highly implausible. Only

the second alternative remains, therefore, and this requires some way of building structure.

It will be recalled that it is non-subs, i.e. collects without the sign-marker associated, which can be meanings within an associator. There is, however, as yet no way to associate non-subs in anything except a structurally neutral way. What is needed is a general mechanism whereby structures of a well defined kind can be built. The method adopted in the model is what might be called the plug and socket method. Every non-sub constitutes a single plug which fits a more or less universal socket (the qualifying "more or less" will be spelt out later). Some non-subs have sockets (one or more) into which the plugs can fit. Non-subs which have sockets are called relators, those that do not, non-relators. It is important to note that ALL non-subs are plugs, be they relators or non-relators. The term relator is intended to be indicative of the fact that a two or more socket relator relates the plugs that fit into those sockets. However, the term relator is still used even when the relator has only one socket and there are, therefore, no relations in the ordinary sense. As an example of the plug and socket method of construction, consider the meanings: "cat", "black", "chases", "dog", and suppose one wants the meanings "black cat" and "cat chases dog". This can be achieved by assuming that "black" has one socket into which "cat" plugs, and that "chases" has two sockets into which to plug "cat" and "dog".

It will be seen immediately, however, that the two sockets of "chases" must be ordered in some way otherwise there will be no difference in the structure of "cat chases dog" from that of "dog chases cat".

In the technical language of the model, I shall not use the terms plug and socket but the more traditional terms of argument and argument-place respectively. Such terms are familiar from mathematical functions and predicate calculus. Indeed, relators could be described using predicate calculus notation so that a one argument-place relator is indicated R_x , a two argument-place relator, R_{xy} , a three argument-place relator, R_{xyz} , and so on, where the variables x, y, z , indicate argument-places. Built into the notation of predicate calculus is, of course, the ordering of argument-places. More usually in treatments of predicate calculus, the one place relation, R_x , is treated as a one place predicate, F_x , but there is no significance in the nomenclature here. The similarity between predicate calculus and the model does not extend very far. Strictly, predicate calculus is an uninterpreted language, whereas the model is not a language at all. When the predicate calculus is given some interpretation, as when, for example, it is used to give translations of some parts of natural language, then some of the terminology, such as predicate, relation, can be viewed as interpretations of items in the syntax of the calculus rather than the names of the syntactic items themselves. The terminology of the predicate

calculus so used appears⁶ to be talking about meaning in a general way and is, therefore, addressing the same area as general semantics as here conceived is. For brevity and convenience, I shall call the use of predicate calculus in this way Pred CI, and I shall discuss some aspects of it as occasion demands in the ensuing text.

Significant structure is to be achieved in the model, then, by associating arguments with argument-places. Sometimes, I shall speak loosely of arguments being associated with relators and this is to be understood as an abbreviated way of saying that arguments are associated with the argument-places of relators. If a relator has more than one argument-place, then those argument-places must be ordered. That this is so has already been seen with "cat chases dog" (CChDI) and "dog chases cat" (DChCI). If CChDT and DChCI are to be different structures, as they are required to be, then the argument-places of "chases" must be different in some way so that when "cat", for example, is associated with one argument-place of "chases" it means something different to that which it means when associated with the other argument-place of "chases". In

⁶ I say "appears" because even when the terminology is used in an interpretative way, it still seems that often it is intended to pick out syntactic subclasses leaving the "real" semantics for some model theoretic interpretation. The assumption that this can be done has to do, I believe, with the claim that there is some given sharp divide between semantic features and syntactic ones. I do not believe there is such a divide and I shall discuss this further in Chapter 3.

the model, a relator can have any number of argument-places and these are considered to be ordered: first argument-place, second argument-place, etc. Argument places are created and ordered with one fell swoop by associating an order-marker, together with perhaps other discriminators, with a focal. Such an argument-place is then associated with a non-sub to form a relator. Precisely how order-markers order arguments is unclear, but it probably has to do with some form of primitive (in the sense of "basic") structure building mechanism. Argument-places could be viewed as place holders for arguments, once present, which have been abstracted away. Such a view is quite plausible, but it forms no part of the basic theory here being developed. Formally, order-markers are specified as follows:

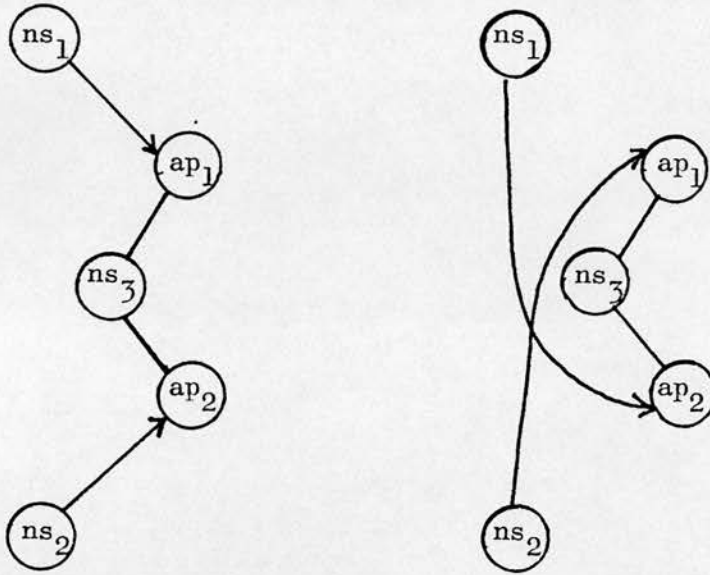
- (9) Order-marker (o) A distinguished discriminator or collect which is associated with a focal to form an argument-place which may be associated with a non-sub to form a relator. The order-marker indicates and effects the ordering of any argument associated with the argument-place in respect of any relator of which it is part. Order-markers are, therefore, of various degrees, and this may be indicated by adding subscripts like so: o_1, o_2, \dots, o_n , where o_1 is to be an argument-place marker for the first argument of the relator, o_2 for the second, and so on.

For completeness, the formal specifications of argument-places, relators, non-relators, and arguments can now be stated.

- (10) Argument-place (ap) An order-marker associated with a focal together with some or no other discriminators.
- (11) Relator (r) A non-sub associated with one or more argument-places.
- (12) Non-relator (nr) A non-sub which is not a relator.
- (13) Argument (a) A relator or non-relator which is associated with the argument-place of a relator.

The difference in structural configuration that the presence of ordered argument-places allows in the case of "cat chases dog" and "dog chases cat" can be seen in figure 2.1.3, where ns_1 is "dog", ns_2 is "cat", ns_3 is "chases". ns_3 is a relator and has two argument-places, ap_1 and ap_2 . In such circumstances, two⁷ structures can be built out of the three elements, ns_1 , ns_2 , and ns_3 , the difference between them depending on whether ns_1 is associated with ap_1 or ap_2 , ns_2 being associated in each case with the remaining argument-place.

⁷ In fact by iteration an indefinitely large number of structures can be built, for example, that corresponding to "cat chases dog chases cat chases dog". Such iteration of non-subs will be seen to be important later, but for the moment it may be ignored.

Figure 2.1.3

It will be a convention of diagrams in the text that a single pointed arrow will indicate that the thing on the blunt end is the argument, whilst that on the sharp end is the argument-place.

So far in the model of the semantic apparatus there are ways of associating discriminators to form collects, of associating the sign-marker with a collect to form a sub, of associating a sub with a non-sub to give the relationship of meaning, and of associating non-subs with argument-places of other non-subs to form non-neutral structures. Such a model is quite powerful, but it fails to make one systematic distinction which is present in the semantics of natural language and which has far-reaching consequences concerning the notion of truth in the model. I shall not have much to say concerning truth in this

section since this will be dealt with more fully when considering meaners existing in an ontologically richer world than W.

Rather, here I want to concentrate on a systematic distinction made in the semantics of natural language, taking it for granted that it is a distinction that the model must capture. This distinction concerns that between proper nouns or, at least, some proper nouns and common nouns.

There is a traditional distinction between particulars and non-particulars or universals, and these notions are generally explicated⁸ by saying that particulars are particular objects, events, people, shadows, whereas non-particulars are properties and qualities. The distinction between particulars and non-particulars is captured in natural language by the distinction between proper and common nouns. I am not, of course, claiming that the distinction between particulars and non-particulars is clear cut, nor am I claiming that there is a clear cut distinction between proper and common nouns in natural language. There are difficult areas when considering these notions, but, at the same time, there do seem to be central cores of clear cases: clear enough, at least, to make the distinctions important.

In the model so far presented, there is one systematic distinction among non-subs and that is that between relators, which have argument-places, and non-relators, which do not

⁸ See, for example, Strawson, 1959 : 15, who states that he is reiterating familiar philosophical uses.

have argument-places. Since so far these are the only two classes of non-subs, asked to say to which the general meanings of the form classes of a natural language like English correspond, one would have to plump for corresponding each form class with either relators or non-relators. If the distinction between proper nouns and common nouns is one that general semantics wishes to capture in a completely general and systematic way using only this twofold classification of non-subs, then either proper nouns must correspond to relators and common nouns to non-relators or proper nouns must correspond to non-relators and common nouns to relators. To the extent that one can talk about Pred CI in these terms, Pred CI adopts the latter course, making common nouns correspond to predicates (one place relations). Pred CI accomplishes this by identifying individuals as primitives. This is done in two ways: First, Pred CI contains proper names (usually indicated by small letters from the beginning or middle of the alphabet) which are interpreted as naming individuals. Second, Pred CI has variables (usually indicated by small letters from the end of the alphabet) which are interpreted as ranging over individuals. Common nouns are then interpreted as predicates, taking as their arguments names or variables. Hence to translate, "Some black dog exists" one would have a formula of the form, " $\exists x (Dx \ \& \ Bx)$ " ("There is at least one individual such that that individual is a dog and that individual is black").

Pred CI is not in fact powerful enough to handle the semantics

of natural language, and some kind of type theory which allows an indefinite number of types, and hence an indefinite number of types of constants and variables, is utilised in formal semantics (cf. Montague 1974, Dowty 1981). Nonetheless, it remains the case in treatments involving type theories that variables over individuals remain basic and common nouns are treated as predicates. The relative success of formal semantics might be taken as showing that common nouns ought to be treated as predicates and, therefore, ought to correspond to relators in the model of the semantic apparatus. Since I shall treat common nouns differently, some comment is in order.

I know of no knock-down argument as to why common nouns should not be treated as denoting predicates requiring individuals as arguments, but the evidence, such as it is, does not support such a treatment. Suppose one naively takes what is going on in Pred CI and more sophisticated theories as indicating that in the model of the semantic apparatus, common nouns should correspond to relators (cnr) and individual variables to non-relators (vnr) which could then be arguments for cnrs. Now what evidence is there for vnrs? Language provides none: no terms occur in language which correspond just to vnrs. The terms, thing, individual, object are sometimes held out as variables in natural language, but as with all common nouns these are treated as predicates in Pred CI, so cannot be the variables sought. But if language has nothing which corresponds to vnrs, why do vnrs ever get associated with cnrs at all? The

relation between cnrs and vnrs seems to be much closer than their distinguishing suggests.

In addition to the lack of evidence for vnrs, there is also a specific problem if they are introduced into the model. It will be recalled that the justification for introducing relators and arguments into the model was that it provided a way of building significant structure. No restriction was placed on which argument could be associated with which relator, for however incongruous the result, significant structure resulted, i.e. the relator unassociated with the argument is different to the relator associated with that argument. But cnrs and vnrs do not preserve this principle except when associated with each other, for suppose a vnr were associated with a relator corresponding to a verb, no significant structure results and the verb relator is just as it was unassociated. Now all this suggests that vnrs are of a different kind to other arguments and not at all like the non-relators corresponding to proper nouns as Pred CI would suggest.

Although these objections to the Pred CI interpretation of common nouns in the model of the semantic apparatus are not conclusive, they are sufficient to warrant a search for an alternative which seems to jar less with the facts as presently understood. To avoid the specific problem mentioned above, I shall take it that both proper nouns and common nouns correspond to non-relators in the model.

The assumption is now, then, that the general meanings

of the form classes in English of proper nouns and common nouns both correspond to non-relators in the model, in the sense that being a common noun or proper noun is at least being such that the meanings of such elements will always turn out to be non-relators for an associator. Such an assumption raises two questions in particular: (1) Does the distinction between relators and non-relators for non-subs correspond to any such distinction in natural language semantics? (2) If the distinction between particulars and non-particulars as partly mirrored in natural language by the distinction between proper and common nouns is an important one, how is the model to capture this?

The answer to question (1) is, I believe, a "Yes", but it is difficult to make the distinction in precise terms. Both proper and common nouns have to do with particulars in a way that other form classes do not. Strawson (1959) brings out something of this distinction in his threefold division of, particulars, sortal universals, and characterising universals. With reservations, Strawson says that particulars can be referred to by the use of some proper names (: 16), sortal universals can be introduced by the use of certain common nouns (: 168), and that characterising universals can be introduced by the use of certain verbs and adjectives (: 168). According to Strawson:

A sortal universal supplies a principle for distinguishing and counting individual particulars which it collects. It presupposes no antecedent principle, or method of individuating the particulars it collects. Characterising universals, on the other hand, whilst they supply principles

of grouping, even of counting, particulars, supply such principles only for particulars already distinguished, or distinguishable, in accordance with some antecedent principle or method. (: 168)

The use of terms such as man, dog, book, will introduce sortal universals. Such sortal universals may be used to distinguish and individuate particulars, so that it makes sense to say such things as "Three men", "A dog", "The book".⁹ In contrast, terms such as run (verb), red (adjective) will introduce characterising universals, and it does not make sense to say: "Three red", or "The red", because the characterising universal, red, (as opposed to the sortal one), requires that what is red be distinguished apart from any distinguishing principle it itself supplies. Hence one must talk of three red things or items and of the red thing or item, where thing and item introduce sortal universals. Some such distinctions as that between particulars and sortal universals on the one hand, and characterising universals on the other seems to correspond to that between non-relators and relators. However, it is important to stress that the distinction between relators and non-relators in the model is not based on such a correspondence, but rather on the requirement for a way of forming well defined structure. If the distinction chosen correctly describes

⁹ The articles are in fact ambiguous in these contexts, having both a particularising (the intended reading above) and a generic reading. Of generics, a little more will be said later.

the semantic apparatus, then one might expect to find some correlate in the semantics of natural language. Strawson's division of sortal and characterising universals hints at what this correlate might be.

In response to question (2), I introduce another marker, called the particulariser, which is formally defined as:

- (14) Particulariser (P) A distinguished discriminator or collect associated with a non-relator to indicate and effect that that non-relator be taken as a particular.¹⁰

The particulariser allows non-relators to be divided into two groups: those that are particular and those that are not. Roughly, particular non-relators correspond to the general meaning of proper nouns and non-particular non-relators to the general meaning of common nouns.

Common nouns can be incorporated into phrases which themselves are particular in the sense that they could be used to talk about individuals. For example, the man, a woman (where the article is particularising), one hundred soldiers, some dogs, all cats, are all phrases which can be used to talk about

¹⁰ The use of the word particular here is perhaps in need of some clarification. It is, of course, true that every collect is particular in the sense that it is one thing rather than another. However, particular as used in (14) and its opposite non-particular have to do only with whether the collect is associated with the particulariser or not.

individuals and one might, therefore, term them particular phrases. The structures which correspond to the meanings of such phrases in the model are particularised by the particulariser being associated with the non-relators they contain. Hence, what is usually a non-particular non-relator becomes a particular one in the context of these structures. One is tempted to suppose that what triggers this particularisation is the presence of quantificational items, "the", "a", "some", "one hundred", "all", in these structures but this can hardly be the whole story since some languages do not have articles, and even in English quantifiers are not always overtly indicated. So neither in the Latin sentence, "Vires ad urbem venerunt" nor in its English translation, "Men came to the city" is there an overt quantifier for "men", yet it is beyond doubt, I take it, that "men" is particular. It seems reasonable in such cases to propose that there is some suppressed quantifier, such as "some"; however, while this seems likely, the clues to there being such a suppressed quantifier seem to be quite subtle since it cannot be held in general that unquantified common nouns indicate a suppressed quantifier because of generic¹¹ terms, or, more

¹¹ What phenomena in semantics the term generic covers varies from writer to writer. See Smith 1975 for a brief survey of the scope of the term. Here I shall confine my attention to the generic use of noun phrases and largely ignore another important use of generic in generic tense. For some interesting suggestions on the latter see Lawler 1972 and Dahl 1975. The interaction between generic tense and the generic use of noun phrases is unclear, but it may be that they have to go in parallel. The only example of a tense which

accurately, of generic uses of terms. Generics form a puzzling and difficult area to make sense of but they have some interest here for the possible light they throw on the normally hidden nature of the semantic apparatus and, for this reason, a short digression to consider them may prove worthwhile.

By generic use of terms I mean the use that is made in (15) - (23) of noun phrases, where no particular lions, children, or sweets are being referred to.

- (15) Lions are gregarious.
- (16) A lion is gregarious.
- (17) The lion is gregarious.
- (18) Children like sweets.
- (19) A child likes sweets.
- (20) The child likes sweets.
- (21) Dogs bark.
- (22) A dog barks.
- (23) The dog barks.

probably cannot have a generic meaning seems to be that of the progressive, but even here there are doubts: can Lions are being friendly at the moment have a generic reading? Surely it can. Lyons (1977 : Vol. I, 194) suggests that generic propositions, and hence, presumably the meanings of the sentences that express them are tenseless, timeless and aspectless and he claims that such examples as: "The dinosaur was a friendly beast" do not refute this suggestion because the past tense is not being used to imply that dinosaurs are no longer friendly but rather that they are extinct. In the example chosen, this may well be the case, but in examples of generics such as "Children liked hoola hoops, but now they do not", such a suggestion is not convincing.

In construing the sentences with articles as generic, one must take the articles in their non-particularising mode. Examples (20) and (23) are perhaps somewhat unfamiliar in this mode, though they seem acceptable after one or two repetitions.

Some writers¹² suggest that the correct interpretations of generic sentences of the forms (15) - (23) is that of construing them as having suppressed universal quantifiers - "all" in the case of plural nouns and "any" in the case of singular nouns; but such an interpretation, as other writers¹³ have pointed out, does not do justice to the meaning of generics. This can be seen by considering (24).

(24) All children like sweets.

A statement of (24) could be refuted by finding just one child who did not like sweets (and surely there are such children), but it does not seem to be the case at all that a statement of (18) can be similarly refuted. If this is so, then it is incorrect to suppose that (24) is a translation of (18), and whatever (18) means it does not mean "All children like sweets".

¹² For example, Perlmutter 1970 in a long footnote, page 239ff, and Kuno 1973, also in a lengthy footnote on page 42ff and another footnote on page 44. As Smith (1975) remarks, much of what is said about generics is contained in footnotes and asides.

¹³ Smith, 1975, Lyons 1977, and Carlson 1977, for example.

Now it might be claimed that whilst the meaning of (18) does not contain the suppressed quantifier "all" it does, nonetheless, contain a suppressed quantifier, such as "most" or "majority", but I think that this can be shown to be wrong. Consider the two expansions of (18) in (25) and (26).

(25) Children like sweets¹⁴, but some (children) don't.

(26) Most/the majority of children like sweets, but
some (children) don't.

(25) seems odd, whereas (26), though seemingly providing superfluous information (because the use of most or the majority already implies "not all"), is not at all odd in the same way. However, if (18) did contain a suppressed quantifier, then (25) should not be odd at all because it would be equivalent to (26). One explanation for the peculiarity of (25) has already been dismissed, viz, that there is a suppressed universal quantifier. If indeed there were such a suppressed quantifier in (18), then this would account for the oddness of (25) as (27) testifies.

(27) All children like sweets, but some (children) don't.

Assuming, however, that the argument against (18) having a

¹⁴ The use of sweets is generic here, but I shall not consider it further in this discussion.

suppressed universal quantifier is cogent—and I believe it to be so—then another explanation is called for.

Tentatively, I suggest that the oddness of (25) derives from the fact that the meanings of the two occurrences of children are not co-extensive in the sense that the meaning of the first occurrence of children is non-particular, whilst that of the second occurrence is particular, being made so by the quantifier. Thus children in its first occurrence in (25) does not refer to individual children, whereas in its second occurrence it does. This difference appears to be captured by the traditional distinction¹⁵ between a term used collectively to refer to a class of objects and a term used distributively to refer to the individual objects of that class; however, a class or collection is just as much a particular as far as the model is concerned as a table or chair. Taking class in a rather literal sense, (25) then translates as (28) which, if it makes sense at all, does not seem to mean what (25) means.

¹⁵ Such a distinction has connections with the traditional logical fallacies of composition and division. The fallacy of composition occurs when, for example, one argues from being able to lift every component of a car to being able to lift the whole car. Here a property of the parts is taken to be a property of the whole. The fallacy of division is the converse, taking the property of the whole to be a property of each part. See Copi 1978 for some details of these fallacies.

There are also connections here with the mereology developed by Lesniewski in response to Russell's paradox of the class of all classes. See Luschei 1962.

- (28) The class of children likes sweets, but some (children) don't.

Carlson (1977) considers in detail and rejects the notion of some unrealised quantifier in generics involving what are known as bare plurals, (15), (18), (21), for example. As an alternative, he proposes that generic bare plurals be interpreted as referring to kinds. Hence, a gloss of (21) would be something like "This kind of animal barks". A kind, for Carlson, is realised by objects which in turn are realised by stages. A series of stage may be related to an object and a set of objects may be related to a kind (: 117). Both a kind and an object for Carlson are what bind, on the one hand, objects together, and, on the other hand, stages together.

Carlson is working within a general framework of truth-conditional semantics and within a particular form of it called Montague grammar, which uses type theory as a basis for an intensional logic. Carlson demonstrates that taking bare plurals (whether generic or not) to refer to kinds allows a formalisable, more or less uniform account of bare plurals to be given. However, as useful and suggestive as Carlson's proposals are, they are philosophically limited in the sense that we are no clearer about the truth conditions for kind terms than we are about the truth conditions for generic ones. What I want to suggest is that the very uniformity that Carlson seeks may not in fact exist and that true generic statements (not just those involving

bare plurals) may have as their chief characteristic that they are not candidates for truth, i.e. they do not, taken at face value, have truth conditions. Such truth conditions as are assigned to them rely, I suggest, on reinterpretation. Because generic statements lack truth conditions, however, it does not follow that they lack meaning. The wedge between truth and meaning, here inserted, will be driven deeper in chapter 4.

It was suggested above that the first occurrence of children in (25) was non-particular, i.e. that its meaning did not have associated with it the particulariser. Now roughly, and pre-empting the more careful formulation given in chapter 4, one may say that what can be non-analytically true or false is a representation of something. The representation will be true if it represents truly and false otherwise.¹⁶ What is represented must be particular for otherwise there will be nothing which can sanction the truth of the representation because everything that occurs is a particular.

Now if it is the case that the true characterisation of the meanings of generics is that they are non-particular, then it will be the case that statements containing generically used noun phrases will not and cannot be judged true or false, i.e. they simply are not the right type of thing of which such

¹⁶ There are a whole host of problems here as the reader will recognise, but these, I believe, are circumvented in chapter 4 and the reader is asked to be indulgent until then.

judgements are made. The consequence of such a view is that statements of any of (15) - (23) can be neither true nor false, and at first glance these seems to be clear evidence against such a view, since one normally takes such statements as things which can have a truth value. If one looks, however, at what happens when such statements are judged true or false, then it seems that a reinterpretation of them occurs and what is judged true or false is not the original statement but an altered, and particularised, form of it. In the case of (18), for example, quantifiers such as all, some, most or qualifying phrases such as on the whole, in general are introduced. Such introduced items have one thing in common, they all serve to particularise the meaning of children so that a judgement as to the truth and falsity of the statement can be made. Indeed, the reinterpretation may sometimes involve talking about the species or kind of something, rather than the individuals, but this is far from saying that all bare plurals should be so reinterpreted as Carlson seems to.

If such a view of generics is correct, then there are three important consequences: First, statements involving generics cannot have a truth value and, hence, this is one way in which generics can be detected. Second, it is mistaken to attempt to translate generic statements into statements which do or could have a truth value, since no such translation could render equivalent meanings. Third and perhaps most important, generic terms give us a direct glimpse of the semantic

apparatus in the sense that they are the pure manifestation of the non-particular non-relator.

The meanings of generic statements can be viewed in this scheme of things as a possible product of the semantic apparatus, but one which in terms of usual statement meanings is incomplete in that it lacks the possibility of having a truth value. The question then arises as to why language utilises generics, given their defectiveness in this respect. One can only guess at an answer, but there may be a number of reasons which conspire to preserve their usage. Their construction parallels constructions in other non-generic statements and, hence, usage may be preserved by analogy. Thus, Lions are coming is very similar to Lions are gregarious, but the first is not generic whilst the second is. Here I dissent from Lyons' (1977) use of generic in generic reference. His examples of this (vol. 1 : 309) are:

(29) It is man that is responsible for environmental pollution.

(30) Men have lived on this island for ten thousand years.

Lyons claims that man in (29) and men in (30) are used as generic referring expressions. But if they were generic in the sense employed here, then they would be non-particular and, hence, could not refer. At the same time, of course, statements of (29) and (30) without alteration could not be true or false if they were generic, but it seems to me that they are perfectly

capable of having a truth value and so are not generic. Thus Lyons' use of generic in generic reference is not to be confused with the use of generic here, for if it were lions in Lions are coming would be generic¹⁷. Another reason why generics may be preserved in language is that they are very easily modified to non-generics and, therefore, their peculiarity is readily explained away by some paraphrase.

One possible objection to treating generic terms as non-particular arises in connection with a distinction of two types of generics made by Smith (1975). He exhibits two paradigms (op. cit. : 28, 29) of generics which he claims distinguishes two kinds of generics. The important examples from these paradigms are (31)a and (31)b from the first paradigm and (32)a and (32)b from the second paradigm.

(31)a the squid lives on seaweed.

b a squid lives on seaweed.

(32)a the dodo is extinct.

*b a dodo is extinct.

(31)a, (31)b, and (32)a are all generic for Smith, but (32)b is not only not generic, but, according to Smith, is not even

¹⁷ Lyons' use of generic comes close to meaning "unspecified" in (30) because the men who did the living were actual individual men but it is not specified which men they were.

an acceptable English sentence. The difference between the types of generic exhibited in (31) and (32) arises because in (31) "... the expression 'lives on seaweed' is predicated of each arbitrary member of the class of squids", whereas in (32) "...the expression 'is extinct' is predicated of the class qua class" (op. cit. : 29). It is this difference, according to Smith, which causes (32)b but not (31)b to be unacceptable.

Now both Smith's use of arbitrary member and class qua class might be taken to argue for an interpretation of generics which involves particulars. In respect to (31), which I take to be truly generic in the sense employed here, Smith appears to be trying to smuggle in universal quantification, as may be seen by considering (33) and its equivalent (34).

(33) Each arbitrary member of the class of squids
lives on seaweed.

(34) Any squid (you care to mention) lives on seaweed.

But both (33) and (34) are refuted by finding one squid that does not live on seaweed, whereas (31)a and (31)b are not so refuted. The argument here, of course, is that (31)a and (31)b could not be refuted in any event because they are not candidates in their present form for truth values.

Concerning (32), I want to argue that this paradigm is

not a generic paradigm at all, and that this explains the peculiarity of (32)b. The first thing to notice about (32)a is that one live dodo falsifies it: one cannot maintain that the dodo is extinct faced with a live dodo. Hence, unlike (31), counter-examples cannot be tolerated. (32)a, then, can have a truth value and this suggests that it is interpreted straight away as a quantified sentence, such as, Every dodo is extinct. Why should this be? One possibility is this: extinction is a definite event, a particular, and what is extinct must have been, and so must have been a particular or particulars. On such a view, it is not surprising that (32)a should immediately be taken to be about particulars, all the particular dodos. (32)b, then, is odd because it is not generic but has the form of a generic.

Examples like (32)a would suggest that whether the particulariser is associated with the meaning of a common noun depends on rather complex considerations. Such examples also indicate that the definite article is not just ambiguous as between indicating particularisation and non-particularisation but also with respect to indicating universal quantification. This conclusion is necessitated by the consideration that (32)a means unequivocally, "All dodos are extinct" or "Every dodo is extinct".

The tentative claim so far has been that generic statements are non-particular and as such cannot have a truth value. There seem, however, to be counter-examples to this

claim. Consider, as one such counter-example, (35).

- (35)a Bachelors are unmarried.
- b The bachelor is unmarried.

In the relevant sense of bachelor statements of (35) are all true, and hence have truth values. Therefore, it would seem that either (35) is not generic or generics can, after all, have truth values. I reject the first possibility and concede that (35) is generic. I also accept that statements of (35) are true, but what I wish to point out is that a special kind of truth is involved. (35) exemplifies what are usually called analytic truths. Unlike (32), there is no question of going out into the world and finding a married bachelor (in the relevant sense of bachelor) as a counterexample to (35); there just could not be such an individual given that bachelor means what it does. Thus while statements of (35) are true they are not truths about the world (contingent truths), but truths in virtue of the meaning of the terms. Contingent truth carries with it the implication of particulars; analytic truth has no such implication. It is for this reason that generic statements can be analytically true or false: such analytic truth values do not depend on particulars.

In view of examples such as (35), a more careful characterisation of generics needs to be made: Generic statements are statements which cannot have a contingent truth

value, though they may, but need not, have an analytic truth value.

Adding the particulariser to the model of the lonely meaner allows a systematic difference in the meanings of common and proper nouns to be captured, while at the same time suggesting a solution to the puzzling phenomenon of some generics. As yet, however, the model is not powerful enough to meet its criterion, viz. that it be able to handle the semantics of natural language. Some of these inadequacies will be removed as the model is developed in ensuing chapters. The relation of the semantic apparatus to language will be considered in the next chapter, whilst negation will be looked at in chapter 4, and sense relations in chapter 5. Enough of the model has already been constructed, however, to make evident that if Wittgenstein's arguments against private language are convincing, then the course adopted here of seeing the key to meaning as being the individual meaner is a gross mistake. Before turning to a consideration of the private language argument, however, there is another general criticism of the model that might be raised and it will be as well to forestall this at this point.

In setting out the basic mechanisms of the semantic apparatus, I have been concerned to construct a model which could capture the meanings and meaning relationships of the semantics of any language (including, natural language). However, in its very capacity, its general capacity, to do this it may be

objected that there is a weakness: the weakness of being too general, of being equally able to handle the semantic structures associated with Jane wore a green dress and The of of the of¹⁸ with the same facility. But such an objection confuses the aims of grammarians with those of general semantics. A grammarian seeks to establish what is grammatical for a particular language at a particular time; however, all that is ungrammatical and all that will ever be ungrammatical that can be talked about will be utterable and will correspond to semantic structures or fragments of a structure or structures. The fact that such structures or fragments of structures do not make sense is no bar to their existing. Indeed, if they did not or could not exist, then what would it mean to say that something made no sense or was nonsense? The semantic apparatus has a capacity to generate both sense and nonsense and the fact that humans, as possessors of realisations of the semantic apparatus, can utter both sense and nonsense bears witness to this. This is the serious point in the joke about the linguist who claims that an utterance, x, in a language, y, is not possible despite his constant uttering of it.

¹⁸ A nonsense "sentence" coined by Sampson 1975.

2.2 General Semantics and the Private Language Debate.

Ludwig Wittgenstein held and argued forcefully that there could not be a private language. The model of a meaner presented in the previous section suggests that, under certain definitions of private language, there could indeed be a private language. Arguments against the possibility of private language may, therefore, be seen as an argument against the view expressed in the last section, and for this reason some comments are in order at this point.

Since language itself has not been discussed in the previous section, it would be as well to make it clear where the model that has so far been presented bears on language. To the extent that language involves meaning, then to that extent language involves the semantic apparatus which the model attempts to describe. Without the semantic apparatus, there would be no meaning. It does not follow, of course, that the semantic apparatus itself provides sufficient conditions for there to be language, but since virtually all of the private language debate is in terms of meaning in language, its relevance to the position adopted here cannot be in question.

Rather than introduce yet a further interpretation of Wittgenstein's position regarding the impossibility of a private language, I shall use two somewhat different interpretations presented by authors who have strong views on what Wittgenstein meant. The authors were chosen for their

reasonable clarity and their different viewpoints, but no claim is made that they by any means cover the complete spectrum of views on Wittgenstein's position. This they certainly do not do since they are both what might be called pro-no-private-language interpretations. But then it is only right and reasonable to consider views which appear to be the least favourable to our model.

We begin by considering Anthony Kenny's interpretation of Wittgenstein on private language (1973). Kenny holds that a private language in Wittgenstein's sense is one whose words refer to what can only be known by the person speaking such a language, that is, such words refer to sensations or experiences which are private to the experiencer and cannot be otherwise. If one accepts that experiences and sensations are private, then the possibility arises that when I use the word red I mean "red" but that when you use it you mean "green". This in turn leads to a scepticism about my being able to know what you mean. Kenny claims that it is part of Wittgenstein's purpose to refute this kind of scepticism. It is important to note that the scepticism involved here is an epistemological scepticism: the problem is not that you could not have the same meaning for words as I do, but that I could not know that you do have the same or a different meaning.

Wittgenstein distinguishes two senses of private in respect of sensations or experiences. Kenny labels these different

senses as incommunicable and inalienable. According to Kenny, a sensation is incommunicable if only the experiencer can know about it. A sensation is inalienable if only I can have my sensation. Kenny's view is that Wittgenstein denies both that sensations are incommunicable and that they are inalienable. Denying that the particular sensation of pain is incommunicable involves denying the disjunction that I can know that I am in pain or other people cannot know that I am in pain. Wittgenstein maintains, according to Kenny, that the first disjunct, viz "I can know that I am in pain", can only be uttered as a joke because it is inconceivable that I could doubt that I was in pain if I was in pain, and where there is no possibility of doubt, there is no sense in talking of knowledge. The second disjunct is rejected on the ground that I can know that you are in pain if, for instance, I see you fall into a fire, and whilst you may pretend to be in pain, it is senseless to imagine that young children and animals feign pain. There are, of course, many objections to these reasons for rejecting the disjuncts, but here I am only concerned to give Kenny's interpretation of Wittgenstein's position in order to see where it does or does not bear on the question of the semantic apparatus.

On the question of inalienability of sensations, and in particular pain, Kenny is much less clear. Kenny claims that Wittgenstein holds that the possessor of pain, that is, the one that feels pain, is the one that gives or could give

expression to it. My pains need not be restricted to my body. Wittgenstein conceives that it is possible that I could have my pain in your body. For Wittgenstein, the questions: (i) Whose pain is it? (ii) How do we identify pain? must be kept separate, for if we allow that the identity of a pain involves its possessor, then there is no possibility that I can have your pain or you mine. Kenny finishes discussing inalienability by holding that Wittgenstein maintained that pain had no special inalienability. This is a rather cryptic way of putting the matter, but I take it that Kenny is saying that Wittgenstein denied the inalienability of sensations.

We move on to what Kenny regards as "the kernel of the private-language argument". This concerns Wittgenstein's consideration of a private-language user keeping a diary in which is recorded occurrences of some private sensation. We are to imagine, according to Kenny, that a sensation *S* is called *S* by its experiencer, and each time *S* occurs the experiencer records *S* in a diary. Now the difficulty for the experiencer is, as Kenny sees it, not remembering rightly the sensation *S*, but rather remembering rightly what *S* means. In order to give meaning to *S*, the experiencer must use memory, that is, the memory of having associated *S* with *S*. But suppose, as Wittgenstein did, that memory deceives, how can the experiencer check that he has the right memory in respect of *S*? Since all public criteria are denied in the private language case, only memory is left, and if this

cannot be relied on then the experiencer can't be said to know what he means from one instant to another, that is, he has no way of maintaining constancy of meaning even if not desiring to do otherwise.

It may be felt that the diary argument would infect public language to the same extent that it infects private language, but in the case of public language, it is claimed, users can correct each other. This, of course, is not satisfactory because each would-be corrector has to rely on memory and this could deceive. This is a difficulty that Kenny does not pursue, but Wittgenstein certainly offers a solution and we shall look at an interpretation of his solution when considering another author's view on Wittgenstein in a moment.

We need now to consider the consequences of the private-language argument as depicted by Kenny in relationship to our model. The fact that our associator is alone in the universe does not necessarily lead to the conclusion that a language, L, using such a semantic apparatus is a private language. Firstly, we need to ask if meanings in L would be incommunicable¹⁹ in principle, that is, if there were other associators around, could such associators plus whatever other apparatus, if any, is needed for knowing, know whatever our associator suitably

¹⁹ What precisely is communicated is somewhat problematic. Kenny talks of "incommunicable sensations" which is, perhaps, a little odd, but incommunicable meaning seems similarly odd. This oddness goes away, I suggest, if one construes communicate in these contexts as meaning something like "share".

adapted could know? In the everyday sense of the word know, I believe the answer is "Yes". This stems from the fact that we have correspondence in apparatus (cf. Wittgenstein's sharing a form of life), and the possibility of external objects creating stimuli. So if an external object creates a stimulus in one associator, then there is the possibility that it will stimulate the very same type of discriminators in another associator. This possibility is enough to refute the claim that meanings in L are intrinsically incommunicable.

If we equate sensations with stimulations, then we can ask if stimulations are inalienable. It should be clear that the answer will be identical to that for pains. If we make the possessor part of the identity specification for stimulations, then stimulations are inalienable. If we don't then we could imagine, as Wittgenstein appears to do with sensations, that a stimulation could occur in one associator and invoke a sub in another. Whether we would accept such a possibility would depend on a careful examination of underlying metaphysical principles. The same is true, I suspect, of Wittgenstein's position. The case of inalienability of stimulations is, then, like that of sensations, an open one.

The diary-keeper argument, unlike those of incommunicability and inalienability, says that the accidental property of there being no other associators is enough to deny the possibility of language because a single associator could not maintain constancy of meaning. The diary-keeper argument if successful

refutes the possibility of any language, private or potentially public, in the case of a single associator. Now we can see at once that the semantic apparatus could malfunction, the association between sub and non-sub could be erased by such a malfunction and the old association so obliterated that no trace of the original association remain. All this is, I think, perfectly possible and it would be true in such a case that the sub concerned had no meaning. It could also happen that a malfunction caused that very sub to be associated with another non-sub. The situation is now parallel to a memory which deceives. It certainly is not the case that the apparatus malfunctions all the time, no more than it could be the case that ALL the money in the world was forged and we did not possess at least a description of what non-forged money was like. For something to malfunction or to be a forgery there must be things, or at least a description of things, which don't malfunction all the time or which are not forgeries; otherwise the terms malfunction and forgery become meaningless²⁰. But Wittgenstein's point seems to be that whatever thing operated with our semantic apparatus it would have no way of telling whether or not there had been a malfunction and, hence, no way of

²⁰ This, of course, is using Wittgenstein's argument about know against his position as depicted by Kenny. Wittgenstein maintained that it makes no sense to speak of knowing unless there can be doubting. Know used in such circumstances is just a joke.

telling whether the meaning of a sub now was what it was before. But why should this matter? It matters because the hallmark of language is that it is a rule-following activity. This rule following extends to meaning in the sense that a sub means a particular non-sub unless this is specifically changed, that is, the meaning rules can be changed, but there are still rules.

The notion of rule in Wittgenstein as Kenny makes clear (although not in reference to the private-language argument), is complicated. Wittgenstein sees a rule as being a practice or custom, able to be repeated in an indefinite number of cases. In order to be said to be following a rule, one has to be aware when one is following the rule and when one is not following it. The point about the diary-keeper argument is that the diary-keeper cannot be said to know whether he is following a rule with regard to S and S since he can only appeal to memory and by assumption memory deceives. Let us summarise the diary-keeper argument as follows:

- (1) All language, including the meaning component, involves rule-following behaviour.
- (2) To follow a rule it is necessary to be aware when one breaks the rule.
- (3) The diary-keeper could have a memory which deceives him.

- (4) Memory is the only possible check one could have on a rule in the case of a private language.
- (5) Therefore the diary-keeper cannot be said to be following rules since his memory could be playing a trick on him so that he thinks he is following a rule when he is not.
- (6) Therefore the diary-keeper does not have a private language because language involves following rules.

It is not suggested that the above set of premisses and conclusions accurately reflects Wittgenstein's position. Indeed, there is considerable difficulty in and contention about formulating Wittgenstein's argument (see in particular Castañeda, Chappell, and Thomson in Jones 1971). The point of setting out the argument in this way is to see the sort of refutation that would be necessary if one is going to insist that a private language is possible. It may be worth emphasising again here that the diary-keeper argument in respect of a single associator is a claim that the associator could not form part of a "language machine" even though the privacy of the language would be accidental rather than logical. This follows from the fact that the only check on whether a meaning rule between sub and non-sub is being followed is the associative link itself, and this

is not logically infallible.

To reject the argument as formulated, we need to reject at least one of the premisses of the inferences. Premiss (1) has fairly wide acceptance. The precise nature of a rule is a matter of debate, but the general notion of language being rule governed seems beyond reasonable doubt. To see this in respect of meaning, consider a case where every time you say blue I give this a different meaning, sometimes it's "red", other times "house" or "car", and I do not realise that I do this. For me, blue could be just what comes into my head, but I never realise that the last time I heard it it meant something different to me. Now extend this to all words and language seems to disappear because the line between language and non-language cannot then be drawn. So premiss (1) is acceptable.

Premiss (2) can be justified too. An organism could exhibit a regular pattern of behaviour and we may be inclined to say that the organism was following some rule or other, but the regular pattern of behaviour in itself does not provide firm evidence (although statistically it may provide some evidence) that a rule is being followed. The regular pattern of behaviour might just be a coincidence. We can only talk of a rule being followed where the organism becomes aware (in some sense of aware - this sense may mean no more than record) that its regular pattern of behaviour is not being followed, that is to say, that we can only speak of a rule

where it can be said that this occurrence is not that occurrence: if there is no comparing of occurrences (of behaviour or internal state or the like), then it does not make sense to talk of rules. Therefore premiss (2) is acceptable.

Premiss (3) is straightforward and I think acceptable. It surely is logically possible that memory could deceive. We need, of course, to note the qualification mentioned earlier in respect of deceive. Memory could not deceive all the time otherwise it would not be deceiving. This point has, I believe, important implications.

Premiss (4) follows from the fact that if the diary-keeper's language refers to logically private meanings, then only memory could provide the evidence for the current meaning being that of the past meaning of some word or symbol. Thus premiss (4) too is acceptable.

Turning to the conclusion at (5), we need to note carefully its conditional nature. Memory MAY be deceiving and therefore the diary-keeper MAY think he is following a rule when in fact he is not, but, equally, memory MAY NOT be deceiving and the diary-keeper MAY think he is following a rule and in fact be doing so. Thus it is not the case that the diary-keeper cannot be said to follow rules at all, but rather it is a situation, where he sometimes thinks he is following rules but is not. Because the diary-keeper is wrong (without, of course, being aware of it) some of the time this does not, and in view of the qualification on premiss (4) cannot, mean that he is wrong

all of the time. A likely riposte to this is that since the diary-keeper will not be aware of his memory deceiving him, he will not be aware of when he is following rules or not. This is true but alters nothing since the position will be that the diary-keeper will think that he is following rules all the time. When his memory deceives him then he will think wrongly: when it does not, he will think rightly and in fact be able to tell whether he is following a rule or not. But, it may still be argued, even when his memory is deceiving him, the diary-keeper will claim that he is following a rule correctly when in fact he is not; so doesn't this show that the notion of correctness or rightness, and hence rule following, is meaningless in this context? If context is restricted to those times when the diary-keeper's memory is deceiving him, then to talk of following a rule is indeed meaningless because whatever concurs with what memory provides in the way of a check will be seen as correct; but the fallacy occurs if one extends context to periods when the diary keeper's memory is not deceiving. To insist that because the diary-keeper is sometimes wrong about following a rule, he cannot be said to follow rules at all, is to introduce a doctrine of infallibility into the private language argument. Nobody, I take it, is proposing that.

The conclusion at (6) does not now follow, and the most that does seem to follow is that at times parts or conceivably all of the diary-keeper's language will be either

not language at all or the first occasion on which a new rule is used.

What this means in terms of the semantic apparatus discussed in the last section is that if a malfunction disassociates entirely a sub and non-sub, then that sub will have no meaning; and if a malfunction changes the sub or non-sub in an association, then from then on the meaning of that sub will be whatever non-sub it is associated with.

I want to turn now to a rather different interpretation of Wittgenstein's private language argument. This is the one expressed in Kripke 1982. Indeed, Kripke's views are so different from other interpretations of Wittgenstein that Ronald Suter (1978) calls such a view a Saul Wittgenstein one. It is no part of my intention, however, to consider the faithfulness of Kripke's interpretation. Rather I wish to consider very briefly his argument on its own merits.

Kripke's view is interesting, it seems to me, because of a particular conclusion it leads to. This conclusion amounts to saying that language does not after all involve following rules, at least not in the way we have used this phrase to date. Kripke, it is true, still regards language as a rule-following activity, but this only goes through, I believe, if the notion of a rule is changed substantially. To see how this position comes about I need to outline Kripke's argument.

Kripke takes as an example of a rule that of addition, but he intends his argument to apply in particular to linguistic

rules. Kripke argues for what he calls the sceptical paradox. He identifies two functions: normal addition – the plus function – and quaddition – the quus function – which is like addition but for any addition where both arguments are greater than or equal to a certain number the answer is 5. For argument's sake he takes this number to be 57. Now we are to suppose that I meet for the first time the sum $57 + 68$, to which I offer the answer 125. A sceptic rejoins, however, that I have no evidence that my answer should be 125 since it could equally be the case that in the past I have been using the quus function in reality and not the plus function at all (on the assumption that I have never added together numbers greater than 56 – nothing rests on the particular number, of course). In such a situation Kripke claims, not only can I not produce any evidence that I have in the past been doing addition instead of quaddition, but, indeed, there is no such evidence available even to an omniscient god, that is, there is no fact of the matter: all my past states and behaviour have been entirely consistent with my carrying out quaddition. Hence I don't know whether I am following a particular rule or not. Kripke, of course, presents this argument in some detail and considers and rejects a number of objections to it; however, here, I am not going to consider these details, but simply accept Kripke's argument and see where it leads.

The essential difference between the diary-keeper's argument and Kripke's is that whereas in the former the

argument relies on (to the extent it is supported by) imperfections in memory, in the latter it matters not at all that memory be imperfect since Kripke's argument does not involve a memory that deceives at all. Let memory be one hundred percent reliable, it is still the case on Kripke's view that an individual cannot be following a rule. This follows from the fact that according to Kripke, there is no fact of the matter concerning which rule was being followed in the past: therefore, there is nothing for memory to remember.

So the individual cannot be said to follow a rule. True, the behaviour of that individual may accord with a rule but then so does a stone tossed into the air in respect of gravity. Can the language community then be said to follow rules? No, because who would or indeed could be the keeper of the rules. I cannot, according to Kripke, follow a rule, nor can you, nor can anybody else. But there are language communities, so language cannot be a rule-following activity. How then is language possible?

Kripke's answer is that when I give the answer 125 to the sum $57 + 68$ I am answering as the plus rule strikes me at that moment. If the way the rule strikes me at that moment accords with the way it strikes you and perhaps other people at that same moment then I have got the "rule" right. In other words, language depends on agreement at the time of use between individuals. This agreement Kripke calls a brute fact which we must accept. He suggests that this is connected with

Wittgenstein's "forms of life". By the use of the word brute Kripke is suggesting that we should not look for an explanation of this fact because there isn't one. Whether Wittgenstein meant this by forms of life is like many things in Wittgenstein open to debate (cf. Black's suggestion (1978 : 330) that by such a term Wittgenstein may have been marking unexplored rather than no-go territory.)

Now as mentioned earlier, Kripke still wants to talk about a language community as following rules, but this, I feel, is very misleading. What Kripke aims to show is that there are no rules in the sense discussed earlier. Having purported to do this, Kripke then uses rule in a new or, at least, very different way. Following a rule for Kripke then becomes not knowingly conforming to some past behaviour pattern but a coincidence of behaviour patterns. Kripke has moved from following a rule to merely according with a rule, and in the latter case rule is really a term in the metadescription.

If it is the case that Kripke has shown that rule-following behaviour is not a criterion of language, then if he has shown that individuals cannot follow rules, then this is no bar to a private language. If it is a brute fact that the language-community members nearly always agree, then it will surely be the case that an individual with his own language will nearly always be "right" in his use of language unless it can be shown that such an individual stops being so agreeable when deprived of companions. Further, on Kripke's view, being wrong seems to amount to

exhibiting linguistic behaviour not in accord with one's fellows. Now if my linguistic behaviour is wrong, in this sense, on a Monday, then it seems logically possible that the language community could adopt this very behaviour on a Tuesday, and then it would be right and not wrong. Hence, no particular linguistic behaviour is absolutely wrong, only relatively wrong with respect to one's language community. The individual with a private language cannot be relatively wrong in this way, but why should the possibility of being relatively wrong be seen as a criterion of language now that this notion of being wrong is divorced from that of following a rule? Kripke offers no evidence. In closing, I want to suggest that this is so because its being possible to be relatively wrong is not a criterion of language in Kripke's sense at all; it is a consequent of his explanation of how public language is possible. If Kripke shows that language is not a rule following activity (in the usual sense of rule) then there is no difficulty at all with private language, but, on such a view of language, an explanation of how public language is possible becomes necessary. Public language is to be explained in such a case by a coincidence of linguistic behaviour. This has the consequence that it is now possible for an individual to be linguistically relatively wrong. Because being possible to be relatively wrong is a consequent of public language, it does not follow that it must be a consequent of private language.

There remains much to say about private language as the very wide literature on the subject bears witness, but it is hoped that what has been said is sufficient to indicate that at the very least the argument against private language is open to a number of substantial objections, some of which have been mentioned above.

3. The Semantic Apparatus and Language

In chapter 2, a criterion for the semantic apparatus was set up, viz. that it be powerful enough to handle the semantics of natural language; however, little was said about the relationship of language to the semantic apparatus or indeed about the nature of language itself as perceived in the present approach. This chapter is intended to correct this deficiency.

3.0 Additional Assumptions on What There Is.

In section 2.1, a highly impoverished world, W , was posited. So impoverished, indeed, that in the end W contained only an associator, a lonely meaner. The purpose of considering the lonely meaner was to emphasise that the semantic apparatus is logically presupposed by language, reference, and truth, by showing that considerable progress could be made in its description without considering in any detail the latter notions. In practice, of course, these latter notions were always in mind, being the only tangible evidence available for the semantic apparatus. From here on,

the world of W is enriched to contain all those things in our world which most of us take as facts: language; reference; truth; other associators, including humans; causation; and the myriad of concrete objects, such as planets, trees and mountains which we generally accept litter the universe. When not wishing to discriminate among these assumptions, I shall lump them altogether and speak of the assumption of external objects. Here, it is intended that external be taken in a sense given by Ayer (1956 : 127; 1973 : 83). This sense is that such objects are inferred as being the causes of sense data. However, in place of sense data I wish to put a particular state of discriminators: the state of being stimulated. It is not implied by this substitution that sense data are in fact discriminators in a particular state and it is not intended that the theory here being developed should be viewed as saying something about sense data. Rather, Ayer's sense of external is taken in this way: In the semantic apparatus, discriminators may be in various states, one of which is the state of being stimulated. It is inferred that this state is induced by some object or objects; however, all that is present in the apparatus are stimulated discriminators, hence, the inference that there is some object causing the state goes beyond the ontology of the apparatus. The assumption that there are external objects, objects which cause this state in discriminators, amounts to the claim that such inferences are usually correct. The qualifying usually is important. The

apparatus might malfunction and discriminators become stimulated when there is no causal agent other than the discriminators themselves. It is this very possibility¹ that makes the existence of external objects an inference.

Above, for the sake of clarity, I have spoken rather loosely about external objects causing the stimulated state of discriminators in a direct manner. More carefully it should be said that such causation might be mediated by various sensory organs rather than the causative influences of the external objects acting directly on discriminators. This having been said, I shall, for brevity, often talk in the looser way.

There are two ways in which a discriminator may become stimulated (a) Via its associative² links with other discriminators. (b) By means other than those involving associative links. This latter way may appear somewhat vague, but (a) and (b) set out precisely the dichotomy required here and I shall not speculate on what means are involved when associative links are not. Suffice it to say, that I assume that it is possible for external objects to stimulate (via sense organs, etc.) discriminators by means other than the use of

¹ In philosophy this is known widely as the argument from illusion. Once one admits that it is possible to hallucinate and to see, hear, touch, or smell, something which is not in fact there, then one seems committed to concede that even when something is there, one's knowledge of it is indirect in some manner and that it is the malfunction of the mediating substance which is responsible for the hallucination. For various formulations of the argument from illusion, see Ayer 1940, 1956, and 1973.

² It will be recalled that the hallmark of association is that it affords access from one item of an association to all the others in that association.

associative links. If this were not the case, then prior to association a discriminator could not be stimulated.

Pretheoretically, both stimulation via associative links and non-associative stimulation are stimulation, but a great deal will in fact turn on distinguishing these two, and for clarity I shall retain the name stimulation for the latter and call the former invocation. The verbs stimulate and invoke are to share the restrictions on their congeners. Stimulation is now to be specified as follows:

- (1) Stimulation The stimulation of a discriminator, discriminators, or collects other than by association. Stimulations are distinctive and ordered.

In contradistinction to stimulation, there is invocation which is specified in (2). The terms stimulata and invocata are borrowed from Latin and will be defined shortly.

- (2) Invocation The stimulation of a discriminator, discriminators, collects, stimulata or invocata via associative links. Invocations are distinctive and ordered.

With both stimulation and invocation it is now possible for discriminators to be in one of four states: (i) being stimulated;

(ii) being invoked; (iii) being both stimulated and invoked; (iv) being neither stimulated nor invoked. States (i), (ii) and (iv) are clear enough, but (iii) may cause a moment's disquiet since it appears that a discriminator may be in two different states at the same time. There is no real difficulty, however, once it is appreciated that the states as described are not mutually exclusive unless their description says so. Hence, a discriminator cannot be in the state of both being invoked and not being invoked, but it can be in a state of being both invoked and stimulated. A simple analogy may make this clearer. Suppose one likens the discriminator to a glass box in which there are two lights, one red, one green. If one then likens the red light being on to stimulation and the green light being on to invocation, then one can see straight away that nothing prevents both of the lights being on at the same time. In terms of actual realisations of discriminators, the situation is akin to hearing the word ball and understanding it and seeing or touching an actual ball at the same time.

Uses of associative links, stimulations, and invocations are both distinctive and ordered, and since these characteristics are to be relied on in making talk about particular uses of associative links, stimulations, or invocations, coherent, it will be as well to spell out at this point what is intended by the terms distinctive and ordered. In doing this, I do not attempt to describe how any such characteristics would be realised in any physical apparatus, but it appears immediately plausible that they could be so realised because humans and

other animals seem perfectly capable of keeping memories of events quite distinct and ordered.

(3) Distinctive Each invocation, stimulation, and use of an associative link, is distinct, numerically different from any other. This is to say that the use of an associative link between two non-subs, ns_1 and ns_2 , at a time T_1 is distinct from a use of an associative link between ns_1 and ns_2 at a time, T_2 , and that an invocation or stimulation of ns_1 at a time, T_1 , is distinct from an invocation or stimulation of ns_1 at a time, T_2 .

(4) Ordered: Invocations, stimulations, and uses of associative links, are ordered or simultaneous. Hence an invocation of a non-sub, ns_1 , at a time, T_1 , is ordered with respect to both an invocation of ns_1 at a time, T_2 , and a stimulation of or the use of an associative link to ns_1 at T_2 unless such stimulation or use of an associative link is simultaneous with the invocation.

Both (3) and (4) need to be interpreted with regard to the individuating of invocations, stimulations and uses of associative links. The individuation of invocations and stimulations is basic, that of uses of associations derivative. An invocation or stimulation of a discriminator is a single invocation or stimulation just in case there are no interruptions in the stimulation or invocation, i.e. there is one invocation, for example, of a discriminator rather than more than one if the discriminator is in the state of being invoked and there is no time within that invocation at which the discriminator is not being invoked. A use of an association between two discriminators, d_1 and d_2 , is a single use of that association if the associative link is being used to sustain a single invocation of either d_1 or d_2 . In the case of association, it is important to bear in mind that a discriminator may be being both invoked and stimulated at the same time; however, an association is only being USED if it is involved in invoking one of its end points. Associations between d_1 and d_2 are not necessarily distinctive and ordered, but the use of such associative links is. This is of prime importance in explaining how it is that the same structure, involving the same non-subs, may occur again and again in the semantic apparatus but each occurrence remain distinct and ordered.

Thus far, stimulations and invocations of a discriminator and the uses of an associative link are distinctive and either ordered or simultaneous. From this basis it is a valid

extension to talk of collects being stimulated or invoked. The way the extension is carried out is quite straightforward. A collect is stimulated or invoked if all of its discriminators are being stimulated or invoked and all of its associative links are in use. The latter detail is crucial otherwise one has a lot of discriminators being stimulated or invoked, but they do not form any kind of unit. It is the use of the associative links between them which establishes the unit. The use of the word all is probably too strong since a collect may contain hundreds or thousands of discriminators and associative links and something less than total involvement of every one of these would probably be justification for talking of a collect being stimulated or invoked. Exactly how many of the discriminators and associative links would need to be involved in any particular case might well depend on the nature of the physical realisation of the semantic apparatus and I merely record here that it seems implausible to require total involvement. It will be useful to have names for particular stimulations or invocations of collects and here I borrow from the Latin.

(5) Stimulatum A collect in a single state of stimulation.

(6) Invocatum A collect in a single state of invocation.

Stimulata and invocata will be distinctive and ordered or

simultaneous because stimulations and invocations are. From this it follows that a stimulum or invocatum may be happening now³ or may have happened in the past. Each single state of being stimulated or invoked that a collect has been in will constitute a single stimulum or invocatum. A consideration of the earlier analogy of the glass box containing red and green lights will perhaps be helpful here. Again it is assumed that the red light being on indicates stimulation and the green light being on indicates invocation. Now assume further that the complete history of the glass box consists in the red light alone being on twelve times, the green light alone being on six times, and both lights being on together three times. In order to count the number of stimula in this example, we simply count the number of times the red light has been on irrespective of what else was happening. Hence, in the history of the glass box, there are fifteen stimula and nine invocata. Further, all the stimula are distinctive and ordered and all the invocata are distinctive and ordered. The invocata and stimula considered together will be distinctive and either simultaneous or ordered.

The essential difference between stimula and invocata is that whilst the stimulation involved in a stimulum is

³ It is a little odd to use Latinisms which mean "having been..." for events happening now, but it may be noted that a discrete stimulation or invocation can only in fact be individuated once it is passed. The more neutral terms of stimulation event and invocation event could be substituted for stimulum and invocatum respectively without any loss except brevity.

assumed usually to be caused by an external object, that involved in an invocatum is produced within the semantic apparatus, although it might well have been triggered by a stimulation elsewhere in the apparatus. Such talk of external objects and of things within the semantic apparatus will mislead, however, if they are taken in a spatial sense. I have already defined the way in which external is to be construed, and if this construal is taken literally, as intended, then many external objects will be inside the physical realisation of the associator and even inside the semantic apparatus itself. The first situation is quite obvious since the associator will have a body of some kind, but that body will not be part of the apparatus. Less obvious is the fact that if a discriminator or part⁴ of a discriminator, d_1 , was claimed to be the cause of a stimulation of another discriminator, d_2 , it would be just as much an inference as it would be to claim that via sensory organs a tree caused the stimulation of the "tree" non-sub.

It will be assumed that operations, events, occurrences or states of the semantic apparatus can be the cause of stimulation in some discriminators. Again, malfunction could produce the same result without these causes being involved, but the assumption will be that usually the

⁴ It was assumed in chapter 2 that discriminators could be of any complexity, but that the proper subparts, i.e. parts which are not the whole, were not available as separate units for association.

inference that there is an x such that x is causing this state is correct. The assumption that the semantic apparatus interacts with itself in this way is just a special case of the assumptions that there are external objects and that such objects have a causal effect on the semantic apparatus, but its particular importance lies in the possibility it opens up of the apparatus partly monitoring itself. This, in turn, allows some meanings to be about internal processes of the apparatus. An understanding of the importance of this rests on understanding how truth is handled in the semantic apparatus, hence I shall not attempt any illustration of the point at this stage.

3.1 Non-symmetric Relational Language.

A relational language is one that is capable of expressing relations, whereas a non-relational language is one that is not. If English were a non-relational language then Jane hit Jill, Jill hit Jane, hit Jane Jill, hit Jill Jane, Jane Jill hit, and Jill Jane hit, would all mean the same because no relationships would hold between the various expressions of meaning. In contrast, in an English that was relational but did not have the stronger requirement of being able to express non-symmetric relations, Jane hit Jill and Jill hit Jane would mean the same: "There was a hitting between Jane and Jill". A relational language without the non-symmetric relation requirement,

lacks the power of being able to express who did what to whom: relations hold between arguments but always symmetrically. All natural languages have the capacity to express non-symmetric relations and henceforth the unqualified use of language is to be understood as meaning "non-symmetric relational language" (NSRL).

The aim here is to give the minimum, general specification for non-symmetric relational language and then in section 3.2 to add the conditions necessary, firstly, for a realisation of an associator to utilise that language and, secondly, for a public non-symmetric relational language.

What is language?⁵ Many definitions have been offered, but here I shall just briefly consider three before making my own offering. Sapir defines language thus:

Language is a purely human and non-instinctive method of communicating ideas, emotions, and desires by means of a system of voluntarily produced symbols. (1927 : 7)

Such a definition is problematic in a number of ways. First, it arbitrarily restricts language to humans and this has the peculiar consequence that if, for example, aliens were discovered who spoke perfect English, one would have to deny under this definition that they were using language at all.

⁵ All the authors of the definitions to be quoted were undoubtedly dealing with non-symmetric relational language and language here is to be construed in this sense.

It is to be noted that it will not do to respond by saying that Sapir was defining human language and not just language per se since this would amount to claiming that the aliens did not have human language because they were not human. This is true, but uninformative concerning what language is, or indeed what human language is. Sapir is, I believe, trying to be informative with regard to the nature of language, but an empirical observation, viz. that it appears that only humans have language, intrudes. Second, if by communicate, Sapir intends, as normal, that something is communicated to another party, then clearly Sapir has in mind public language. Again, in its given, strong form, this has the unfortunate consequence that a being alone could not have language. This is a logical claim and, as was seen in chapter 2, such a claim appears to have been made by Wittgenstein; however, there is no indication that Sapir intended to make such a claim, and his definition is perhaps better construed as requiring language to be a potential method for communicating. Here, once more, an empirical observation that humans don't or can't live alone from birth and have language intrudes and gets mixed up with the definition of language itself. Third, the notions of communicate, idea, and symbol are no less in need of explanation than the notion of language itself and this has the effect of limiting the usefulness of Sapir's definition.

Saussure offers a number of definitions of language, of which perhaps the clearest is:

Language is a system of signs that express ideas... (1916 : 16)

Later (op.cit: 66), Saussure will use sign to indicate the combination of a sound image, the signifier, and a concept or idea, the signified, but at this stage he is using it in the way he describes as "current usage" (op. cit: 67), to indicate only the sound image. The important thing to note is that a sound-image for Saussure is not a sound, nor is it a public thing, but rather it is ".... the psychological imprint of a sound, the impression that it makes on our senses." (op. cit: 66). Two items at least, then, in the ontology of language in Saussure's definition are internal to the individual and this is worth emphasising since, so often, it is the social side of language as construed by Saussure which appears dominant.

Saussure's definition of language is quite abstract and avoids some of the major pitfalls encountered in Sapir's definition. This definition, of course, still relies on rather vague notions, viz. "ideas" and "express", and the connection of signs with sound-images is unnecessarily restrictive and an intruding empirical observation which is readily refuted even among humans by the phenomenon of sign language. Nonetheless, Saussure's definition has, I believe, much to recommend it, and my own offering, using the model developed so far, can be seen as being in the same vein.

As an example of a present day view of what language is, consider the following definition offered by Halliday:

A language, then, is a system for making meanings: a semantic system, with other systems for encoding the meanings it produces. The term 'semantics' does not simply refer to the meaning of words; it is the entire system of meanings of a language, expressed by grammar as well as by vocabulary. In fact the meanings are encoded in 'wordings': grammatical sequences, or 'syntagms', consisting of items of both kinds - lexical items such as most verbs and nouns, grammatical items like the and of and if, as well as those of an in-between type such as prepositions. (Halliday 1985 : XVII)

It will be noticed that all three of the definitions quoted employ the word system, but it is Halliday who has given perhaps the most precise definition of what is meant by this word in his work, although in some of his definitions important criteria seem to be missing, for example:

A closed⁶ system is a set of terms with these characteristics:

- (a) the number of terms is finite: they can be listed as A B C D, and all other items E... are outside the system.
- (b) each term is exclusive of all the others: a given term A cannot be identical with B or C or D.
- (c) if a new term is added to the system this changes the meaning of all the others. (1961 : 247).

A system for Halliday is not in fact determined by these

⁶ As Halliday notes, the inclusion of the word closed is redundant in a sense but kept to distinguish a system from the category of grammar he calls system.

characteristics and later he offers more succinct and complete definitions, for example:

A system is a set of options with an entry condition: that is to say, a set of things of which one must be chosen, together with a statement of the condition under which the choice is available. (1969a : 3)

In his definition of language, however, Halliday appears to be using system for what he elsewhere calls system network.

The system network is the grammar. The grammar of any language can be represented as a very large network of systems, an arrangement of options in simultaneous and hierarchical relationship. (1969a : 3)

Language for Halliday is, therefore, a phenomenon such that it can be described as or represented by a system network in which meanings can be "made" and encoded. Although in his definition, Halliday goes on to speak of meanings being encoded in "'wordings'", he prefixes this by the words in fact, and I take it that this, therefore, marks the observation as being an empirical one rather than part of the definition itself.

Halliday's definition relies on the vague notion of meaning and as such remains vague unless this notion can itself be made more precise. In "Categories of the Theory of Grammar" (1961 : 244/5), Halliday divides meaning into formal meaning and contextual meaning. "Formal meaning is

the 'information' of information theory..." (: 244) and, "The formal meaning of an item is its operation in the network of formal relations" (: 245). Whilst, "Contextual meaning... is quite distinct from formal meaning and has nothing whatever to do with 'information'. The contextual meaning of an item is its relation to extratextual features; but this is not a direct relation of the item as such, but of the item in its place in linguistic form: contextual meaning is therefore logically dependent on formal meaning". (: 245). Contextual meaning for Halliday is, therefore, referential meaning, the connection between language and the world, whilst formal meaning is determined by relationships to other linguistic items.

Now, however, a difficulty arises for it seems that on the assumption that Halliday is not using meaning in a pretheoretical way in his definition of language, we have two interpretations of the definition, both of which are unsatisfactory. First of these interpretations is that in which the vagueness of contextual meaning is assumed to be unimportant in the sense that it logically presupposes formal meaning and since formal meaning is made precise, formal meaning can do all the work in the definition. This interpretation, however, makes Halliday's definition circular, for meaning is defined in terms of systems, system networks, and linguistic items, and language, and hence linguistic items, are defined in terms of meaning and systems. Therefore, either meaning and semantic should not appear in the

definition of language, or else they mean something over and above "formal meaning". The second interpretation is, therefore, to count contextual meaning as being an important element over and above formal meaning. In this case, however, since contextual meaning is left vague and in its pretheoretic state, the definition of language inherits this vagueness.

Halliday, of course, might be using meaning and semantic in a pretheoretical way, but then, as noted, this is to define language in no clearer terms than the term language itself.

Central to the notion of language is the notion of meaning. An objection to this view might be this: It is possible to construct an uninterpreted formal language strictly according to the shape or some other intrinsic property of its primitive elements. No meaning is involved in such a language; therefore, is it to be discounted as a language? I think there are two responses possible here. One is that of claiming that formal languages are not really languages at all and that one is attempting to characterise "real" or "natural" languages and for these purposes formal languages do not count. Such a response would, I believe, be a mistake for the same reason that characterising human language as language used by humans is a mistake: it is uninformative. The other response is to insist that if a formal language is indeed a language, however deficient in terms of natural language, then central to it will be the notion of meaning. I believe in fact that however austere the characterisation of a formal language is,

it meets the meaning criterion. To see how this comes about, consider how it is that one distinguishes the specification of a formal language from that of, for example, the specification of patterns in brickwork. Now it is quite conceivable that the patterns of objects specified in the case of the formal language and that of the brickwork are identical, i.e. nothing in the pattern specification, the way of arranging the objects, distinguishes the formal language from the brickwork. Notice that there is no difference in abstraction here: the brickwork specification is no more talking about particular tokens of arrangement than the formal language specification is. So how does one distinguish between the formal language and the brickwork patterns? The answer, of course, is obvious: one does so because in one case the specification is talking about bricks and in the other about symbols. The types of objects over which the patterns are specified count and, in fact, determine what it is that is being specified. But central to the notion of symbol is meaning. To be a symbol is to be such as to be able to have meaning and to explicate what a symbol is requires the use of the notion of meaning.

Still, it might be argued, a really carefully specified formal language would make no claim about its objects being symbols, but would just identify the types of object by their shape or weight or colour, etc. Hence there would be no symbols and thus no notion of meaning at all involved, and, therefore, no language. The question then arises as to whether

this loss to the language family is to be regretted. I think not. Such a "language" would be sui generis and have nothing particular in common with languages specified over symbols. The only common element would be that there were patterned elements, but this feature would be shared by the brickwork example and all other patterns of objects, and one might just as well and just as incongruously call such a "formal language" a brickwork specification as a language.

If the notion of meaning is central to that of language, then it should be possible to characterise language, at least partly, in terms of the semantic apparatus because relational meaning, i.e. meanings which can stand in relationships to each other, or at least relational meaning of a sufficient power to handle the semantics of natural language, can only arise in the semantic apparatus on the view taken here. This characterisation I call The Language Criterion:

The Language Criterion

A non-symmetric relational language is a set of subs which are associated with non-subs, both relators and non-relators, some ordered or unordered subsets of which may be formed into structures, and if a particular such subset may be formed into more than one structure, then there is a principle or set of principles which at least partially determines in most cases into which structure that particular subset of non-subs is formed.

By the term structure, I mean a collect which contains some significant structure in the sense of chapter 2, i.e. a collect which contains arguments and relators and in which the arguments are associated with the argument-places of the relators.

Specifically, a structure is defined as:

- (1) Structure An association which consists of argument(s) and relator(s) and in which the argument(s) are associated with the argument-place(s) of the relator(s).

The Language Criterion is intended to form the necessary condition for non-symmetric relational language: without its being met, there is no non-symmetric relational language. Whether it is a sufficient condition is, I believe, a question of what phenomena one wishes to embrace in the name of language. Certainly the Language Criterion makes no mention of the external objects (in vocal human languages, sounds) which are inferred to be the stimuli of subs and without which, and indeed more, a plausible account of public language seems not to be possible; but I shall leave discussion of these matters until the next section. Here, rather, I wish to consider whether this claimed necessary condition of language has any undesirable consequences in disallowing that certain languages are languages at all.

There are at least two possibly difficult areas that need to be looked at. The first concerns the austere formal

language defined over symbols, to which I turn in a moment. The other, of much less importance, concerns dead languages or, rather, dead and not understood languages, something like Linear B before its decipherment in 1953. Since the Language Criterion specifies that a language consists of a set of subs etc. and since there were no realisations of subs and non-subs instantiating Linear B in 1950 because all the Minoans who use it were long dead and nobody at that time understood it, it would seem that in 1950 Linear B was not a language. This result is not, however, at all undesirable since Linear B was never strictly a language even when being written onto the soft clay tablets which were to be found many centuries later. Linear B was and is a writing system for a language, and only derivatively and loosely can it be called a language itself. The general point underlying the position here is this: non-natural meaning does not exist without meaners and signs or symbols which are so in virtue of their capacity to have non-natural meaning lose that capacity in the absence of meaners, and, so, are signs and symbols no more. The marks I make on this page are just ink marks on a page in the absence of meaners.

Although it was held earlier that even austere uninterpreted, formal languages involve the notion of meaning in the sense that they are defined over symbols and symbols can only be explicated in terms of meaning, it does not follow that such languages meet the Language Criterion. Indeed, they clearly

do not, for although one can view the symbols of such languages as corresponding to subs, there appears to be nothing which corresponds to non-subs. Such a conclusion will occasion little surprise, I think, and the only surprise might be the amount of mention that such formal languages are here receiving. There is, however, I believe, a possible misperception of the role of syntax in language which is fed and nurtured by the role of syntax in such formal languages and, therefore, a consideration of austere formal languages is a prerequisite for clearing up this misperception. And cleared up it must be for otherwise the role assigned to (and, I believe, the true role of) syntax in the approach taken here is likely to cause some, and perhaps much, consternation.

It will be observed that The Language Criterion does not mention syntax but does talk about principles which in part might determine semantic structures when choice is available. I am guilty of some dissembling here for I intend that such principles are what are normally called in natural language syntax. This claim concerning the role of syntax amounts to this: The principles of syntax operate directly and only on non-subs and hence directly and only on meanings as construed here. It follows from this that any features that syntax operates with will be semantic features, and syntactic features, to the extent that they can be identified, will be a subset of semantic ones. The syntax of austere formal languages is defined over the intrinsic properties of the vocabularies

and, as such, makes the above view of syntax in language untenable if it is taken to be a paradigm of syntax in language. Some discussion of syntax will, therefore, be appropriate and I take this up in section 3.3.

3.2 Public Language

In this section, I consider what must be added to The Language Criterion (repeated below for convenience) to obtain public language. The first step in this process is to connect language to the world external to the associator.

The Language Criterion

A non-symmetric relational language is a set of subs which are associated with non-subs, both relators and non-relators, some ordered or unordered subsets of which may be formed into structures, and if a particular such subset may be formed into more than one structure, then there is a principle or set of principles which at least partially determines in most cases into which structure that particular subset of non-subs is formed.

In The Language Criterion, no mention is made of the stimulation of subs and non-subs. Such stimulation is assumed to be a causal effect of some object or other on a sub or non-sub and, as pointed out in section 3.0, that

there are such objects is inferred. Such objects are called in section 3.0, external objects, and stimulation forges the link between these external objects and the associator. The causal effects of such objects on subs and non-subs may not be (and almost certainly is not) direct, but mediated by all kinds of organs and processes in an actual realisation of the semantic apparatus.

Suppose now that an associator, A, is in our familiar world and that under The Language Criterion A has language, what connections with the world could that language have? There are two possible⁷ connections. First, there could be objects which stimulated A's subs, or some of them. Hence a sound token of the word tree might stimulate a sub, s, in A. Second, a tree might stimulate a non-sub, ns, in A. Should s and ns be associated in A, then tree will mean for A what it does for English speakers. It must be emphasised that such stimulations are causal and not arbitrary. What are arbitrary are the groupings of discriminators in s and ns, the association of the sign-marker with s, so making it a sub, and the association of s with ns. The second of these arbitrary occurrences has the consequence that had the sign-marker been associated with ns instead of s, then a

⁷ These are only possible connections because perversely A could be in a world where there were no objects which had a causal effect on its discriminators or discriminators could have been so associated as to be only stimulated as a group by non-occurring concomitances of objects.

tree would have meant the sound of the word tree for A.

It is these two possible connections between A's language and the world which allow a plausible⁸ account of public language to be given. The view of public language taken here is perhaps somewhat controversial and it will be as well to state at this stage two respects in which it is likely to appear controversial.

- (1) Although the view of public language taken here allows as a natural extension communication, communication is not taken as a basic feature of public language. Rather it is public similarity and sameness of meaning which are taken to be basic and to underly communication. Public similarity and sameness of meaning are notions, however, which present certain difficulties and these difficulties are considerably exacerbated by the second respect.
- (2) The view of public language adopted here assumes that it makes sense to consider as a possibility that two different species or a machine and a human could have a common language. If this is so, then the requirements for public similarity and sameness

⁸ The alternative, the implausible account, requires that public language be just a coincidence of personal languages.

of meaning need to be specified very carefully, since one can no longer talk in terms of similar realisations of semantic apparatus, that is to say, that the idea that a public language must depend on shared physiology is rejected.

(2) in particular, has surprising and perhaps unsettling consequences which touch aspects of Quine's notion of radical translation and the indeterminacy thesis⁹. This will be discussed further in the light of The Public Language Condition to be given. This condition is rather involved and first I state it, then I explicate it.

The Public Language Condition

A language, PL, is a public language if:

- (a) There are at least two associators, A and B, such that there is a set, EO, of external objects, each member of which stimulates some sub in A and some sub in B.
- (b) There is a non-empty subset of EO, the core subset, such that each member, c, of that core subset stimulates some sub, x, in A and some sub, y, in B, and x is associated with some non-sub, m, in A, and

⁹ Quine 1960

- y is associated with some non-sub, n, in B, and m and n are stimulated by some external object other than c.
- (c) The meaning of the members, if any, of the complement set of the core subset with respect to EO are definable in terms of the members of the core subset.
- (d) The subs and non-subs of A involved in PL constitute a language under The Language Criterion and the subs and non-subs of B involved in PL constitute a language under The Language Criterion.

It will be convenient to think of the set, EO, of external objects as consisting of sound tokens since this is the case in the majority of human languages; but in fact any external objects meeting the criteria of The Public Language Condition would do as well. Criterion (a) of The Public Language Condition states that there has to be at least two associators for a public language and that there has to be a set of external objects, EO, such that any member of EO will stimulate some sub in A and some sub in B. This amounts to saying that the objects in EO have each to be a stimulus for subs in both A and B for there to be a public language. This seems to be a necessary condition of a public language involving A and B since otherwise there could be tokens of the signs of the public language which had no causal effect on A or B. Such signs

could not be part of the public language. Criterion (b) requires that there be a non-empty subset of EO , the core subset, which meets certain conditions. A diagram may help make these conditions clear.

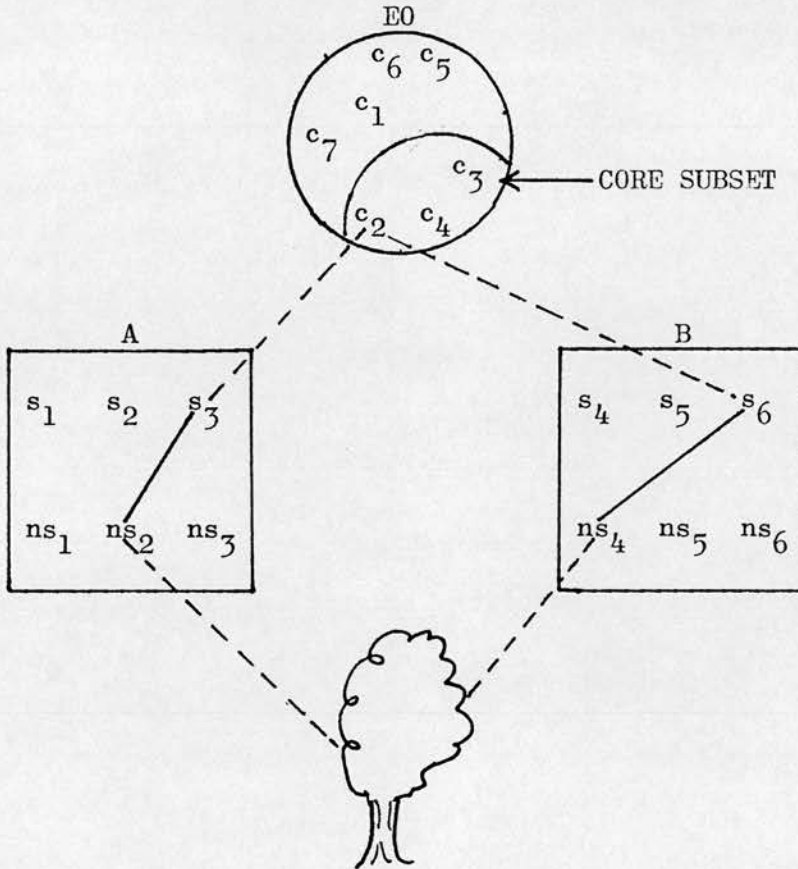


Figure 3.2.0

In the diagram a member, c_2 , of the core subset of EO is a stimulus source (indicated by dotted lines) for the sub, s_3 , in A and the sub, s_6 , in B . In turn, s_3 is associated with the non-sub, ns_2 in A , whilst s_6 is associated with the non-sub, ns_4 , in B . Finally, both ns_2 and ns_4 are stimulated

by the external object, tree. Criterion (b) of The Public Language Condition requires that a similar story can be told for each of the elements of the core subset. The claim here is that a public language cannot exist without there being at least a subset of the signs of that language which refer, or could be used to refer, to external objects. Without such a subset, there would be no basis for claiming that a single language was common to at least two individuals, since there would be no reason, except for coincidence, to deem that those individuals had the same public or very similar public meanings for the signs of the language¹⁰. This follows from the assumption made in (2) above that sameness or similarity of subs and non-subs between associators cannot be directly established. Criterion (b) sets up a kind of functional equivalence between non-subs, but, as will be seen shortly, it is only "a kind of" because it turns out that ns_2 and ns_4 of the Figure 3.2.0 could be responding to quite different stimuli, although all the stimuli would still be properties of the tree.

The purpose of criterion (c) of The Public Language Condition should now be much clearer. Whatever objects of the language are in EO but not in the core subset must be definable in terms of the members of the core subset since

¹⁰ In practice, the fact that two speakers use all the same signs is a good guide to them having the same language, but this fact alters not at all the possibility that two speakers could have all the same signs but have completely different semantic systems for these signs.

there are no external objects to guarantee their public sameness of meaning for A and B. So, for example, if tokens of the word unicorn appear in EO and have their usual meaning, then those tokens will not appear in the core subset of EO because there are no unicorns. Unicorn will have to be defined in terms of the members of the core subset of EO or in terms of members of EO themselves defined in terms of members of the core subset. There are, of course, iconic representations of unicorns: pictures, models, films, and these complicate the matter considerably, but what is clear and must be clear to a speaker of the public language is that a picture or model of a unicorn is not itself a unicorn. To establish precisely the role of iconic representations in public language is beyond the scope of this work, but *prima facie* two remarks can be made. First, it would seem that a proper consideration of iconic representation might lead to revisions in The Public Language Condition. These revisions would not, I feel, alter its substance, but they would make it more accurate. Second, a great deal of definition does proceed without the use of iconic representations. For instance, most dictionaries have very few drawings or pictures, but function, nonetheless, perfectly satisfactorily. This suggests that the reliance of The Public Language Condition on non-iconic representation is plausible.

Criterion (d) of The Public Language Condition requires

that the subs and non-subs in A and B which are involved in the public language should constitute for each associator a language under The Language Criterion. Bringing in this criterion merely serves to avoid having to restate The Language Criterion within The Public Language Condition.

I wish now to return to (2) above and to consider a case which brings out its radical quality. The Public Language Condition permits that two individuals having very different realisations of the semantic apparatus might have a common language. For example, one realisation might be in terms of human brain cells and the other in terms of electronic circuits. In such circumstances, the causal effect¹¹ upon the discriminators of a non-sub will be different in each of the apparatus simply because the discriminators themselves are differently constituted. It might be thought that the difference is limited by the requirement that both sets of discriminators must react to the same object¹²; however, by postulating concomitant properties the difference could in fact be very radical indeed.

¹¹ Such effects will usually be mediated by other organs and the constitution of such organs might well increase the possible differences. Here, however, for clarity of presentation, I ignore these details.

¹² What it is for an object to be the same or a similar object for two associators can be made precise and will in fact be made precise in chapter 5 where much depends on it.

By concomitant property I mean a property which always accompanies another. Hence the property of a tungsten filament lamp of emitting light when supplied by electricity is accompanied by the property of heat emission. In this case, light and heat are concomitant properties. Now imagine that the property of being red has a concomitant property called colouron and that there are two realisations of the semantic apparatus such that one is human and can detect red but not colouron, and the other is alien and can detect colouron but not red. Under the Public Language Condition, the human and the alien could have a common language because the criterion for public similarity of meaning is met even though for the human the word red (or colouron - only one will appear in the language, of course) will mean something's being red while for the alien it will mean something's being colouron. Thus, the disquieting result is this: under The Public Language Condition the word red will mean the same for both the alien and human, although considered objectively red means something different for each of them.

The colouron example pushes to the extreme the notion that underlies what might be stated as Quine's (1960) thesis of the possibility of objectively divergent meaning of a common language for two¹³ speakers. The word objectively

¹³ As can be seen from the quotation, Quine states his thesis in terms of a single speaker, yet it claims show most clearly in the case of two speakers. Quine himself recognises this by illustrating the thesis in terms of translation.

here and in the preceding paragraph is meant to indicate that the divergence of meaning could only be divined by a being outside the language and with powers greater than the speakers of the language. Quine states this thesis like this:

- (3) ...the infinite totality of sentences of any given speaker's language can be so permuted, or mapped onto itself, that (a) the totality of the speaker's dispositions to verbal behaviour remains invariant, and yet (b) the mapping is no mere correlation of sentences with EQUIVALENT sentences, in any plausible sense of equivalence however loose. Sentences without number can diverge drastically from their respective correlates, yet the divergences can systematically so offset one another that the overall pattern of associations of sentences with one another and with non-verbal stimulation is preserved. The firmer the direct links of a sentence with non-verbal stimulation, of course, the less that sentence can diverge from its correlate under any such mapping. (: 27)

This thesis has become known as the thesis of the indeterminacy of translation because Quine illustrates his thesis in terms of radical translation, but it would be misleading to construe Quine's thesis as being restricted to translations between one language and another.

By radical translation Quine means the translating by a linguist of a previously unknown language without the help of interpreters, of whom it may be assumed there are none. The fact that such translation is rarely if ever undertaken is, as Quine notes, beside the point because the example is used to illustrate a phenomenon which Quine claims exists independently of the details of the example.

The first step that the linguist takes in radical translation is, Quine suggests, that of making tentative translations of those native utterances which seem to be connected to events conspicuous to the utterer. Quine offers the example (: 29) of a rabbit scurrying by and the native speaker uttering Gavagai. The linguist might guess that such an utterance means something like, "There's a rabbit", but in order to test such a guess the linguist must try to rule out other possibilities, such as, "There's an animal" or "There's something white" (if the rabbits happen to be white). To make such tests, the linguist must be able to repeat the native utterance of Gavagai in varying contexts and observe the native's assent or dissent. Quine believes (: 29f) that it would be quite possible to establish when the native was assenting or dissenting. By utilising such tests, the linguist could establish the stimulus meaning for utterances of such sentences as Gavagai. For Quine, the stimulus meaning of a sentence, s , consists in an ordered pair such that the first member is the affirmative stimulus meaning of s and the second is the negative stimulus meaning of s . Quine spells out what an affirmative stimulus meaning consists of on page 32 (op. cit.): "...a stimulation σ belongs to the affirmative stimulus meaning of a sentence s for a given speaker if and only if there is a stimulation σ' such that if the speaker were given σ' , then were asked s , then were given σ , and then were asked s again, he would dissent the first time and assent the second". Hence if the linguist's guess about

Gavagai meaning "There's a rabbit" is correct, rabbits will be stimuli in the affirmative stimulus meaning of Gavagai. The requirement that there be some stimulation that does not evoke Gavagai from the native speaker or his assent to its use is necessary to distinguish what Quine calls observation sentences like Gavagai from stimulus analytic sentences like Pigs are Pigs (: 67), the latter of which are distinctive in having no stimulation which evokes dissent.

Observation sentences such as Gavagai might therefore be fairly translated using the notion of stimulus meaning, for if all stimuli which prompt the native speaker to assent to the use of Gavagai are those which prompt the linguist to assent to the use of There's a rabbit, and all stimuli which prompt the native speaker to dissent from the use of Gavagai are those which prompt the linguist to dissent from the use of There's a rabbit, then it can be reasonably concluded that Gavagai has the meaning "There's a rabbit" and There's a rabbit has the meaning "Gavagai". Quine notes certain difficulties with the stimulus meaning of observation sentences, such as the presence of rabbit-fly (: 37) which might lead to the native speaker assenting to the use of Gavagai because culturally the rabbit-fly is taken as a sign of rabbits even though no rabbits are in fact to be seen; however he concludes (: 40) that the discrepancies occasioned by such causes will be overwhelmingly outweighed by the coincidences of stimulus meaning between Gavagai and There's a rabbit.

In comparison to observation sentences there are non-observational sentences (: 46), and although both observation and non-observational sentences are what Quine calls occasion sentences, he often uses occasion sentence in contrast to observation sentence to mean "non-observational sentence". The term occasion sentence is in general contrast to the term standing sentence. Assent to an utterance of the former type requires an appropriate stimulation, whereas no such appropriate stimulation¹⁴ is required for an assent to the use of the latter kind. As examples of occasion sentences, Quine offers Gavagai, It hurts, and His face is dirty (: 35), and as examples of standing sentences, he gives There is ether drift, and The Times has come (: 36). Only the rather special kind of standing sentence, the stimulus analytic, are further considered by Quine and it would seem that all other kinds of standing sentences are subsumed under occasion sentences (in the sense of "non-observational sentences"¹⁵).

¹⁴ In practice, Quine notes that occasion sentences grade into standing ones and that assent to the utterances of some standing sentences can be prompted by stimulations. So he notes that assent to the utterance of the standing sentence The Times has come can be prompted daily by the paper's appearance.

¹⁵ I shall use occasion sentence in this way from now on because Quine appears to by and large and it will make references to Quine 1960 easier to follow.

Quine points out that stimulus meaning is of little help with regard to translating occasion sentences since the stimulus conditions vary so much (: 46). So one speaker might assent to the use of the sentence Bachelor prompted by the appearance of a certain man, whereas for another speaker this appearance prompts dissent or no reaction at all. Knowing that someone is a bachelor requires knowledge not divivable from the appearance of the individual, and this knowledge will not be shared equally among the members of a community. Synonymous sentences for a particular speaker can, however, be established because any such speaker will assent to the use of a sentence wherever she assents to the use of its synonym. What cannot be done with occasion sentences is to translate them via stimulus meaning.

Stimulus analytic and stimulus contradictory sentences share with occasion sentences their untranslatability via stimulus meaning. A sentence is stimulus analytic if the speaker will assent (or, dissent, in the case of the stimulus contradictory) "...come what stimulation may". (: 66).

Quine argues in addition that truth functional connectives in the unknown language can also be established and translated. He then sums up what the linguist can achieve in the field in radical translation: observation sentences and truth functions can be translated; stimulus analytic and stimulus contradictory sentences can be recognised but, like occasion sentences, cannot be translated (: 68). Leaving aside truth functions

with which I shall not be concerned here, it is to be noted that what the linguist has so far translated are observation sentences, not the words or terms in those sentences.

The indeterminacy of translation arises for Quine when the linguist attempts to translate the stimulus analytic, the stimulus contradictory, and the occasion sentences of the unknown language, for at this point the linguist must use what Quine calls analytical hypotheses.

An analytical hypothesis is involved whenever the linguist segments a sentence of the unknown language and translates those segments into the words or phrases of his own language. So as Quine points out (: 51), the stimulus synonymy of the sentences Gavagai and Rabbit does not guarantee that the terms gavagai and rabbit are co-extensive. The term gavagai might in fact denote rabbit stages or undetached rabbit parts and there is in practice no way of distinguishing a rabbit stimulation from a rabbit stage stimulation because one always accompanies the other. Here can be seen the common ground between the colouron example and Quine's position. Quine assumes by and large that the linguist sees or could see the world much as the native speaker of the unknown language does, but the colouron example, assuming no necessary shared physiology takes Quine's point to the extreme and suggests that it could happen that an alien and a human could not have the same "picture" of the world because they were each stimulated by just one and a different

stimulation of a pair of stimulations which always accompanied each other.

The linguist's first analytical hypotheses will be about observation sentences such as Gavagai and the translations of the segments of such sentences will be used to make translations of occasion sentences. The restraints on the formulation of these analytical hypotheses are the requirement to conform to usage of observation sentences, stimulus analytic/contradictory sentences, and stimulus synonymous sentences. However, as Quine has shown by the gavagai example, the most accessible items for translation, items, therefore, which offer the greatest restraint on analytical hypotheses, are not necessarily straightforward. A wrong choice made concerning gavagai can be concealed by choices concerning other analytical hypotheses. For suppose, as Quine does (: 72), that some construction in the unknown language is translated as "are the same" then by use of this construction the linguist could establish that gavagai meant "rabbit" rather than "rabbit stage" by seeing whether the same rabbit seen twice was one gavagai or two; however, if on the other hand this construction of the unknown language was translated as "are stages of the same animal", then the linguist could not so distinguish. Quine's point is not that there is a right and a wrong translation, but rather that there is no way to make a right translation, for always by compensatory adjustments in other analytical hypotheses it is possible to find another translation

which meets all the constraints of observation sentences, stimulus analytic/contradictory sentences, and stimulus synonymous sentences.

Some¹⁶ have argued that Quine's thesis will not go through, but to the extent that they succeed, such success seems due to the linguist having available the same range of stimulations as the native speaker. The colouron example explicitly denies this and, at the very least, increases the work that must be done to refute Quine's thesis once it is generalised across species. Quine, of course, being behaviourist in outlook is a strange bedfellow for the theory of a meaner being presented here, but there is a common notion, I believe, underpinning both his thesis and The Public Language Condition stated earlier which, roughly put, is that public meaning may bear only a shadowy resemblance to private meaning.

Even if Quine's thesis should prove incorrect, the colouron example remains. Are the consequences of the colouron example unacceptable? What makes the colouron case a possibility - albeit it a remote one - is the fact that The Public Language Condition does not specify a required physical similarity in the realisations of the semantic apparatus. The consequence, however, of adding such a requirement would be that humans could have a particular public language, some

¹⁶ Bennett, for example, in Bennett 1976 : 257 ff.

aliens could have a different public language, and perhaps even some machines could have yet another different, public language; but none of these public languages could overlap and, hence, there could be no linguistic communication between the species. This, I feel, is an unwelcome consequence and one which should be avoided if at all possible. In the end it is a question of choice, and I prefer to accept the possibility of concomitant properties and all that this entails rather than rule out a priori the possibility of our establishing a common language with other life forms which might exist in the universe or with our own machines.

3.3 Syntax

It will be useful to begin a consideration of syntax by reviewing what the syntax of an austere formal language consists of. Usually, the syntax of such a language is held to consist of two components: the specification of the vocabulary (the symbols) and the specification of the well-formedness rules, i.e. the rules which specify which are the well-formed formulas or strings of the language and which are not. Here, as is often done, I shall speak of the well-formedness rules as syntactic rules. As a concrete example of the syntax of particular austere formal language, AFL, consider the following.

AFLVocabulary:Syntactic Rules:

(a) A triangle or a square may occur alone or to the right or left, but not both, of a circle.

(b) Nothing else is a well-formed formula of AFL.

Of the two syntactic rules, (b) is known as the exclusion clause and is put in just to spell out what formulas are not well-formed in AFL, viz. all the formulas which cannot be generated by applying rule (a) to the vocabulary. Under rule (a), the well-formed formulas of AFL are in fact:



and nothing else.

The syntactic rules of AFL get a "grip" on the vocabulary by being defined over intrinsic properties of the vocabulary. Thus it is the triangleness, the roundness, and the squareness, of tokens of the vocabulary which allows the syntactic rules to pick them out and specify how and how not they may be combined.

Modern syntactic theories have much in common in

appearance with specifications of formal languages. Their vocabulary is well defined and usually consists of category symbols, such as, N, V, Adj, NP, VP, and possibly features, such as, COUNT, SINGULAR, TRANSITIVE. Here I shall ignore features and just consider category symbols for the sake of simplicity. This is possible because I am not here concerned with details of such syntactic theories but rather with certain aspects of their common form. In addition to their vocabularies of symbols, such theories have rules defined over these symbols. These rules may specify ways of combining symbols, of replacing one with another, of changing the order of symbols, or even of deleting some symbol. In other words, these rules specify the well-formed strings or trees or formulas of the theory, and they do this by being specified just as in the case of AFL, with respect to the shapes of the symbols. It is to be noted that syntactic theories (at least the formalised ones) do not in general specify directly the well-formed strings of the language being described because such theories work with symbols not found in natural language (except in the jargon added to natural language by such theories). These theories make contact with natural language via a lexicon in which words of the natural language being described are assigned to one or more of the terminal¹⁷

¹⁷ A terminal symbol is one that cannot be replaced under the rules of the particular theory by another or other symbols.

symbols of the syntactic theory. The words in the lexicon may then function in the theory courtesy of this assignment.

What allows a formalised syntactic theory to be connected to the natural language it claims to describe is, therefore, the lexicon it employs. What underlies the assignment of words to the categories denoted by terminal symbols of the theory is, therefore, of vital concern. That the syntax of natural language operates on words in some sense has been the traditional view, and this tradition carries on into the present where typically syntax is held to be "...a description of the various ways in which words of the language may be strung together to form sentences". (Culicover 1976 : 2).

For a syntactic theory to be about something, its symbols must have meanings, and if one asks what the category symbol N or V means, the answer will usually be "noun" and "verb". Then, however, the question arises as to what nouns are. In response to this a list of words which are nouns are proffered. But look at or listen to this list of words as hard and as long as one likes, one will not be able to divine from any of their intrinsic properties that they are nouns¹⁸. What then makes them nouns and how can the syntactic rules pick them out as nouns if they exhibit no property which characterises them

¹⁸ Of course, one can pick out by their shape some nouns in some languages once one knows what to look for, but in general this is not a necessary characteristic of natural languages.

as such? One stock response is that nouns, and word-form¹⁹ classes in general, are identified by distribution²⁰, i.e. a noun is a word form which can occupy certain, and only certain, positions in sentences or phrases. The other word-form classes are identified distributionally in similar fashion. Syntax, therefore, may be seen as defined in actual fact over form and positions and only derivatively over word forms. A category symbol in such a syntax would then denote a class (unit or otherwise) of environments, where an environment is a particular position among forms. But whilst this is formally adequate for a description of language, it fails to have the explanatory²¹ quality needed for a part of a theory of language because it amounts to sayings that *x* fits into slot *z* because *x* is found in slot *z*. Such a claim fails to explain why *x* fits into slot *z* despite having no intrinsic

¹⁹ Word is several ways ambiguous and it is clearer to switch to talking of word-form classes and word forms at this stage rather than word classes and words. Cf. Matthews 1974.

²⁰ I am not here concerned with the problems that occur in using only distribution to identify word-form classes or in the difficulty of identifying nouns, for example, as a cross-language category. And I am not suggesting that anybody attempts to go about these tasks in PURELY distributional terms.

²¹ Explanatory is used here in both the Chomskyan sense (Chomsky 1965 : 26 -27) and in the more general sense of explaining connections between the phenomena of the world rather than merely describing their juxtaposition or ordering.

features which so constrain it. If syntacticians are content with mere description, this lack of explanatory quality will not, of course, concern them, but if, as I believe and, as my use of theory throughout suggests, they are concerned with explaining natural language, then this circularity should give some cause for concern.

My reason for pointing up this difficulty with syntactic theories is that I wish to propose (and have to in view of the model of the semantic apparatus presented) that syntax does not operate on any formal property of word forms, but rather on features of their meaning. Now this proposal, while it affects not at all what formal theories of syntax actually describe - since such theories say nothing about the non-syntactic properties of the objects over which they are defined, may be felt to be undermined by the supposed reliance of such formal theories on criteria of form and shape. What the foregoing argument was designed to show is that these criteria are simply inadequate.

It will be recalled that in the model of the semantic apparatus a sub, once stimulated, immediately invokes the non-sub²² which is its meaning and takes no further part in any semantic structure involving this non-sub which is built. Wherever syntax enters the picture, therefore, it cannot be at the sub level. In fact, I assume that syntactic rules operate at non-sub level where all meaning features are available, and

²² A sub may, of course, be ambiguous and be associated with more than one non-sub.

that syntactic rules operate on a subset of semantic features and usually the order²³ of occurrence of non-subs. The requirement that semantic structure can only be built by associating arguments with relators forms a general constraint on what structures can be formed, but once there is a choice of structures, then syntactic rules are needed to determine the choice. I assume that within semantic constraints, syntactic rules are idiosyncratic.

I now want to consider the role of syntax as envisioned in the model of the semantic apparatus in a little more detail. This, it is hoped, will make that role quite clear and allow certain implications that this view of syntax has to be readily seen. Suppose that one had an unordered set of three non-subs, $\{ \text{"Jill", "hit", "Ann"} \}$,²⁴ then given that "hit" is a two argument-place relator, the semantic structure building mechanism permits two structures to be built, "Jill hit Ann" and "Ann hit Jill". This occurs because either of the arguments, "Ann", "Jill", may occupy either of the argument-places of "hit". The unordered set, $\{ \text{"Jill", "hit", "Ann"} \}$, therefore allows a

²³ It is difficult to imagine a syntax operating effectively on unordered sets of non-subs although prosodic features in natural language, which carry semantic information, of course, do not seem to be ordered. However, a case of syntax operating on a totally unordered set of input does not seem logically impossible and one way in which this might be envisaged is that the syntax counted some semantic features as having inherently higher order than others and, hence, thereby allowing, for example, two possible arguments for a single argument-place to be handled in a regular way. I shall not consider unordered sets further in any detail below.

²⁴ The reader will recall that words in double quotes are meanings and that those underlined are forms.

choice of semantic structures to be formed and contains nothing which determines which one is to be formed. Conversely, the structural information concerning the order of arguments contained in the semantic structure, "Ann hit Jill" cannot be conveyed by the unordered set and since this set will correspond via subs to the English words Ann, hit, and Jill, this structural information cannot be imparted by the English language if only unordered sets of its word forms are assumed. If it is now assumed that there is an ordered set, $\langle \text{"Jill", "hit", "Ann"} \rangle$, of non-subs, the choice of the two semantic structures which may be formed from it still remains because it is not assumed that there is any natural²⁵ order of occurrence of arguments. To turn the ordered set of non-subs into a semantic structure in a consistent way, a syntax is necessary. Such a syntax will, in this case have two inputs: order and the properties of the item occurring at each point in the order. It seems reasonable that in order to generalise in the most economic way over non-subs, the syntax will only be sensitive to certain widespread properties of those non-subs.

The point at which a non-redundant syntax becomes needed in a language would seem to depend only on the occurrence of sets of non-subs which allow a choice of structures to be built. If, for example, one Latinises the names in the set

²⁵ The proposal that there is in fact a natural word order in human languages has been put forward by Jan Firbas of the Prague School of Linguistics.

of non-subs considered above, then only one semantic structure is possible. Hence in the case of the set, $\{ \text{"Jillam"}, \text{"hit"}, \text{"Anna"} \}$, of Pseudo-Latin meanings, there is no choice of semantic structure since "Anna" being nominative can only go in the first argument-place of "hit" and "Jillam", being accusative can only go in the second argument place. Of course one would not have to go very far in considering sets of Latin meanings before both order and a non-redundant syntax became necessary.

Why should it be reasonable to think, however, as I claim, that what syntax is actually defined over, i.e. what it operates with, in the world are parts of meanings? I believe the thought is reasonable on two counts: economy and plausibility. The economy argument is not terribly strong but I think it has some merit. It is essentially this: If it is the case that syntactic features are other than specialised uses of certain semantic features, then such features must be learnt and stored in addition to meanings. This would be less economical in terms of learning time and storage than the assumption that certain semantic features did double duty. The plausibility argument, I believe to be more substantial.

First, there is the problem of learning: if syntactic features are not specialised uses of semantic ones then somehow a child in acquiring its native tongue must learn the syntactic features associated with each word form and keep them separate from the meaning. Since clearly word forms do not wear unambiguous indications of their syntactic

features on their sleeves, this information must be deduced from their position in utterances as well as their form, and so deduced in isolation from meaning. It may be felt that the latter requirement does not follow, but if semantic and syntactic features are truly independent, then it does, for if there are connections between them, then those connections must either be arbitrary and add rather than decrease the learning burden, or non-arbitrary, i.e. causal. But if they are causal, then how does one know that there really are two objects causally connected rather than a single object? Short of showing that there are syntactic features without such connections²⁶, which, of course, requires that syntactic category be learnt independent of meaning, I do not see that this can be done. Therefore, the supposition must be that if the syntactic features are connected with semantic ones, then either they are arbitrarily connected and probably increase the learning load still further, or the possibility of them being one and the same features²⁷ clearly exists. It seems more plausible that first language learners should utilise features of the very tangible meanings they associate with word forms to mark out syntactic categories, rather than go straight to a very abstract notion of such categories.

²⁶ Any grammatical theory which makes a full-word/form-word distinction may seem to make this claim, but I doubt it can be upheld. See section 0.2.

²⁷ This is not to say that the set of semantic features is the set of syntactic features, since much turns on the notion that syntactic features are only a subset of semantic features.

Second, word forms which occur in word-form classes seem to have something in common in terms of meaning. I do not say that this is a particularly tangible something, but that it is there seems beyond dispute. Robin Lakoff used what she called semantic markers²⁸ to subcategorise Latin verbs into meaning-classes in order that their syntactic behaviour might be specified. She has this to say about meaning classes and the number of semantic markers utilised by the syntax:

We define a meaning-class in terms of both syntax and semantics, as a set of semantic markers that can function in syntactic rules. Not all semantic markers function in syntactic rules. For example, the semantic markers that define verbs of ordering will function syntactically in a redundancy rule specifying that, for this semantic class, one or more of the complementizer-changing rules must apply. On the other hand, for verbs of eating there is no semantic marker that functions syntactically or that distinguishes a rule that applies to verbs of eating from one that can apply only to verbs of drinking or verbs of digesting. (1968 : 165).

It would be an implausible coincidence if main word-form classes and subclasses of these exhibited meaning similarities and yet semantic features played no part.

Householder (1962) showed the implausibility of the thesis that word-form classes are independent of meaning. Lyons (1977 : 375) sums up Householder's claim and draws

²⁸ The term semantic marker was introduced by Katz & Fodor 1963. No harm will arise if it is thought of in the above context as meaning "semantic feature".

the consequence like this:

What cannot be done, it would appear, is to change the distribution of all of the word-forms in a language whilst holding constant the meaning of the lexemes of which they are forms or to change the meaning of the lexemes²⁹ without affecting the distribution of the associated word-forms (cf Householder, 1962). The theoretical conclusion to be drawn from this fact is that there is an intrinsic connection between the meaning of words and their distribution; and it is for this reason that it is difficult to draw the boundary between syntax and semantics.

Third, there is, as Lyons points out, great difficulty in drawing a boundary between semantic and syntactic features, and this suggests that there is in fact no boundary at all in reality, but rather a cline from semantic features that have general use in syntactic rules to semantic features which have only occasional use. In addressing the question of the boundary between syntax and semantics, Chomsky (1965), viewing this cline as a scale of grammatical deviance, observes that:

If the distinction between strict subcategorisation rules and selection rules noted earlier is generally

²⁹ Lyons holds that meanings belong to lexemes and not to word forms. I do not share this view since this requires that either inflexions do not have meaning or that a word form such as girls is a form of the lexeme GIRL plus a form of the morpheme PLURAL. The former option is, I believe, quite wrong and whilst the latter might be true, it still requires a way of referring to the combination of the meanings of the lexeme and morpheme. Rather than proliferate terminology it seems reasonable to talk of the meaning of the word form.

valid, we might go on to superimpose on the scale of deviance a split into perhaps three general types, namely the types that result from: (i) violation of lexical category (such as (6i); (ii) conflict with a strict subcategorisation feature (such as (6ii)); and (iii) conflict with a selectional feature (such as (6iii) and (2)). (: 153)

- (6)(i) sincerity may virtue the boy.
 - (ii) sincerity may elapse the boy.
 - (iii) sincerity may admire the boy (: 152).
-
- (2)(i) colorless green ideas sleep furiously
 - (ii) golf plays John
 - (iii) the boy may frighten sincerity
 - (iv) misery loves company
 - (v) they perform their leisure with diligence (: 149)

Chomsky is claiming in the above that (6i) is the most grammatically deviant because it breaks a category rule, viz, using virtue as a verb, whilst (6ii) is somewhat less deviant because it only breaks a strict subcategorisation rule, viz. using elapse as a transitive verb. Finally, (6iii) and (2) are still less deviant because they break only selectional rules. To take the case of just (2i): abstract things, like ideas, do not have colour, what is coloured cannot be colourless, abstract things do not sleep, and sleeping is not done furiously. What Chomsky is suggesting is that the strength of grammatical deviation is an indication

of the importance or centralness of the feature constraint being violated, but as he points out (: 150, and footnote 5: 227/228) the matter is in fact more complicated than this and even low-level deviance inducing features in selectional restrictions can produce "totally unacceptable" examples such as (1), where the feature [HUMAN] is required to stop its generation.

- (1) the book who you read was a best seller (: 150)

The debate over what features are syntactic and the difficulty of drawing a line between syntactic features and semantic ones suggests that syntax shades into semantics. The most plausible reason, I believe, why this should be so is that syntactic rules "help themselves" to semantic features as the need arises. Leech (1974), whilst only going as far as to say that syntactic and semantic features "correspond", nonetheless notes the close correspondence and suggests why some features are utilised by the syntax rather than others:

Thus although the categories of syntax are much fewer than those of semantics, they are given importance (sometimes inappropriate importance from the semantic point of view) through their obligatory status. These syntactic categories generally correspond with semantic features which are of particularly wide use either because they are formators (e.g. definiteness, negativity) or because they have a focal position in the taxonomic 'tree' of contrasts (p.121; e.g. countable/mass, singular/plural). (: 189)

Assuming that syntax operates on semantic features does not require that syntactic and semantic rules necessarily "respect" each other in all cases. Usually, one might expect that they would, but given that syntax uses only some semantic features to identify its objects, it seems quite possible that it should allow as the semantic rules do not, "Colourless green ideas sleep furiously". To be explicit: Assume that "colourless", "green", "friendly", and "bright" all share the semantic feature, α , that "furiously" and "contentedly" both share the semantic feature β , and that "ideas" and "people" share the semantic feature γ . Assume further that the syntax operates on the features α , β , and γ among others. In such a case, the syntax will just as readily "approve", "Colourless green ideas sleep furiously" as it will, "Bright friendly people sleep contentedly" because the syntax is "blind" to the other semantic features that these meanings possess. The mechanism which underlies the incongruity of certain grammatically (i.e. syntactically) acceptable semantic structures involves what I shall call semantic congruity and this will be introduced in the next section.

The view of syntax taken here is that it is a device for connecting meanings. This is a traditional view of syntax according to Matthews (1981): "Traditionally it [syntax] refers to the branch of grammar dealing with the ways in which words, with or without appropriate inflections, are arranged to show connections of meaning within the sentence"

(: 1)³⁰, and should not, therefore, occasion any surprise.

Where this approach goes further is in proposing that in fact actual syntax is defined over aspects of meaning, semantic features, and that it would be a misperception of what many syntactic theories are about if it was felt that they offered any grounds for rejecting this proposal out of hand. The idea that syntax and semantics operate on something common is not new and the tentative feelings of many are perhaps well expressed by Hudson (1976):

...I think it is still an open question whether the 'separateness' of semantics and syntax lies in their needing separate structures, or whether they could perhaps be considered to be different aspects of the same structure, each giving a different range of information about the sentence, in terms of a different VOCABULARY of features. (my emphasis). (: 178)

Before leaving the subject of syntax, I wish to raise a problem for the view of syntax expressed here. This concerns cases where one feels that one can identify a semantic feature which is used by the syntax and then one is faced with apparent counter-examples to the claim that this feature is in fact being used by the syntax. Hudson (1976 : 6) cites what he feels to be the clearest example where the

³⁰ Matthews contrasts this view of syntax with that held by Culicover (quoted earlier), calling Culicover's view of syntax "distributional" (op. cit.: 22).

meaning of a form is semantically singular whilst it behaves syntactically like a plural³¹. Hudson gives two examples, viz. bathroom scales and oats, but there are in fact many more, especially connected with clothing, e.g. panties, tights, shorts, briefs, trunks, trousers. The suggestion is that all these terms are semantically singular, whilst syntactically they are plural. Hence one does not say, "This panties is pink",³² rather, "These panties are pink". However, the claim that these terms are semantically singular is not straightforward. In all the examples except oats, one cannot use the word one without introducing the word pair. Thus "One panties" is not acceptable but "One pair of panties" is, and one asks for one pair of bathroom scales, not for one bathroom scales. If these terms were really semantically singular it might be expected that one would be able to use one directly with them and that the use of pair would produce an oddity of meaning.

³¹ Hudson in fact cites also the converse of the phenomenon, but I do not find his examples convincing. In particular, he talks of verbs such as disperse which require a plural subject semantically, but some of whose subjects are syntactically singular. Hence, because of the acceptability of "The committee disperses", Hudson believes that committee is semantically plural. However, this does not seem to follow since a committee considered as a body is singular. What might be required for using "disperse" is that the body has parts which can disperse. This is not at all the same as being plural.

³² The supplement of the O.E.D. does in fact cite examples of the singular panty.

Oats raises different issues because it involves mass terms, the semantics of which are far from simple and have been the subject of considerable debate³³. A discussion of the complexities of mass terms is beyond the scope of this work and it is an open question whether examples like oats and perhaps other examples of a quite different type might turn out to be genuine counter-examples to the thesis that syntax operates on semantic features. What should be apparent is that to say what semantic features such apparent counter-examples have is not a straightforward matter and it might well turn out to be the case that categories such as singular and plural as presently conceived are too gross to capture the subtlety of what is going on or are not in fact homogeneous and are confusing matters by subsuming disparate things.

3.4 Semantic Congruity

It was noted in the last section that the syntax might well allow semantic structures to be built which are odd or strange from the point of view of meaning. Since Chomsky (1965), these oddities have been largely viewed as arising from selection-restriction violations and handled in the lexicons of grammatical theories. The nature of the problem and the fact that it has to

³³ For some idea of the range of the problem and the differing views, see Pelletier 1979.

do with specific items of vocabulary is widely agreed, and I do not demur from that agreement. What I want to do here is to suggest a way in which these selection restrictions can be captured by the model of the semantic apparatus.

The semantic structures corresponding to sentences (1) to (8) are all possible under the semantic-structure building requirements and probably under English syntactic constraints. Their meanings, however, are odd or strange in varying degrees and semantic congruity is here put forward as a general explanation of this oddness.

- (1) The rock died.
- (2) Rank milk.
- (3) Addled words.
- (4) Jane eats beauty.
- (5) Persuasion drove the car.
- (6) Colourless green ideas sleep furiously.³⁴
- (7) John frightened sincerity.³⁵
- (8) The horse miaowed.

These sentences are not in any order of the oddness of their meaning. They are merely intended as a sample of the very large number of sentences whose slightly odd, odd, or very odd

³⁴ Originally appeared in Chomsky 1957 : 15

³⁵ From Chomsky 1965 : 157

meanings are to be explained by semantic congruity.

Before the notion of semantic congruity can be explicated, some consideration of what a semantic feature is will be necessary. Up till now the term semantic feature has been used in a rather vague way. For the purpose of explaining semantic congruity it is necessary to make it more precise, although this precision will in no way affect what has been said up to this point. A semantic feature in the model of the semantic apparatus being presented is a discriminator or a group of discriminators of a non-sub which is associated with a sub.

There are two requirements to bear in mind when seeking an explanation of the oddness of the meaning combinations associated with sentences like (1) - (8). The first is that the oddness of meaning combinations does not appear to be an absolute: we may grow accustomed to an odd meaning combination and it may thus lose its oddness. The mechanism which explains oddness must also explain how oddness can come and go. Second, closely associated with the first requirement and a consequence of it is the requirement that, given the non-absoluteness and, indeed, variability of oddness of meaning combinations, one cannot postulate that oddness of combination of meanings is an intrinsic property of those meanings, for if it were then it would not be defeasible. What this second requirement amounts to in fact is that one cannot say that the meaning of (2), for example, is odd because in the meaning of rank

there are semantic features which have some built-in natural antipathy towards some semantic features in the meaning of milk. Instead, some mechanism must be proposed which accounts for the oddness of meaning and yet explains how that oddness can be neutralised without requiring that either of the non-subs corresponding to rank and milk lose any of their semantic features.

It will be recalled that an argument-place consists of an order-marker associated with a focal together with some or no other discriminators. Suppose now that one assumes that there are other discriminators involved in a particular argument place, then it could be the case that any argument which "plugged in" to that argument-place would have to have discriminators which were identical to those in the argument-place. Here, being identical means that the discriminators are in fact the very same discriminators used twice over. Now suppose that the argument did not have discriminators which were identical to those of the argument-place, then it would be the case that these different discriminators in the argument-place would add meaning to the argument and this would account for some of the oddness in meaning combinations. A diagram may help to make clear what is going on.

In Figure 3.4.0, the circles represent the meanings of the words printed inside of them, and the square box represents the single argument-place of "died". In the argument-place is a semantic feature AM (animate). If the argument which slots into this argument-place is to be

semantically congruous, then it too must contain or have the semantic feature AM, but in looking among the many semantic features that "rock" does have, no AM can be found and the argument lacks semantic congruity with respect to that particular argument-place.

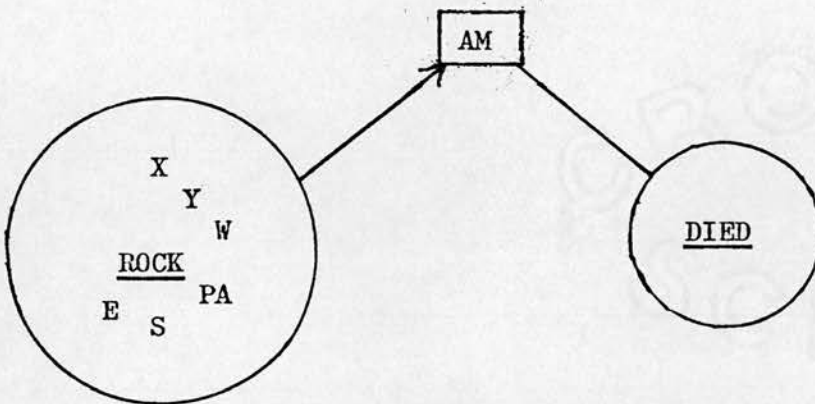


Figure 3.4.0

It is to be noted that an argument can, and normally will, have many more discriminators than an argument-place. The first requirement of semantic congruity is that those discriminators, apart from the order-marker, which are present in the argument-place must also be present in the argument associated with that argument-place. If this is not the case, then the extra discriminators in the argument-place will extend the meaning of the argument and a degree of oddness will result. The first requirement for semantic congruity is a necessary but not a sufficient condition on which to base a general

statement of semantic congruity. This is because in many languages form indicates argument function, i.e. part of the meaning of a particular form is that it is a first or second or third argument. An example from Latin should make this clear.

(9) Caesar Juliam amavit.

(10) Caesarem Julia amavit.

In (9) the nominative ending of Caesar indicates that it is the first³⁶ argument of amavit, whilst the accusative ending of Juliam indicates that it is a second argument. In (10), these roles are reversed. The meaning of Caesar, therefore, includes the semantic feature of being a first argument³⁷, whereas the meaning of Caesarem includes the semantic feature of being a second argument. This is quite unlike languages which do not in general inflect for argument function. So in the English sentence in (11) the form Jane does not give, independently of the sentence in which it occurs, an indication

³⁶ (10) is in fact unusual Latin, but I have opted for less elegant Latin to emphasise that in talking about first and second arguments, I am not talking about order in the sentence. Conventionally, I treat the subject argument as first argument.

³⁷ It is not here being suggested that these arguments are not complex: an argument can be as complex as one likes and have as much structure as one likes. It would, therefore, be perfectly consistent with the view expressed here to hold that the meaning of Caesar is a structure composed of some basic meaning and the nominative meaning.

of its argument function.

(11) Jane loved John.

Semantic congruity requires that an argument which has a feature specifying argument function (first argument, second argument, etc.), be associated only with an argument-place having that same feature. This requirement is in contrast to the first requirement of semantic congruity specified above since in that case it is what is contained in the argument-place which determines what the argument must have. In this second requirement the converse applies with respect to the order-marker: if an argument contains an order-marker, then it will only have semantic congruity with its argument-place if in addition to meeting the first requirement of semantic congruity, the order-marker the argument contains is also present in the argument-place.

More formally, semantic congruity and its dependent notion, congruous argument, are specified as follows:

(12) Semantic Congruity Semantic congruity obtains between an argument-place and its associated argument if all the semantic features apart from the order-marker present in the argument-place are also present in the argument and if any

order-marker present in the argument
is also present in the argument-place.

- (13) Congruous Argument An argument which has semantic
congruity with its argument-place.

Lack of semantic congruity does not, of course, prevent semantic structures being built otherwise structures corresponding to the sentences (1) - (8) would not arise. What the mechanism of semantic congruity does give is a reason for their oddness. If the sentences, (1) - (8) are syntactically well-formed (and this is not beyond dispute), then it can be seen that the syntax in these cases is operating with semantic features other than the offending ones. In (3), for example, the syntax merely requires that an argument of "addled" have the semantic feature that common nouns have; however, the argument place of "addled" has an apparent disjunctive semantic feature something like "brain or egg", and hence since "words" does not have either of these features, the meaning of (3) is odd. Similarly in the case of the other examples there will be semantic features in argument-places which extend the meaning of the arguments because those features are not already present in the arguments.

Semantic congruity explains only certain meaning incongruities, others like "The dead man is alive" depend on sense relations and these will be discussed in chapter 5.

4. The Semantic Apparatus and Truth and Falsity

In this chapter, I shall be concerned with how the notions of truth and falsity are handled in the approach to general semantics which is being followed here. Inevitably, this will involve some claims about the nature of truth, but I shall not attempt to discuss in any detail standard theories¹ of truth because to do justice to these would require a digression of disproportionate length. Rather I shall allude on occasions to some of the standard theories and the discussion they have invoked where this seems helpful or relevant.

¹ The most notable standard theories of truth are:

The Correspondence Theory This is by far the oldest theory and a version of it was adopted by Russell (1912). For a more recent account, see O'Connor 1975.

The Coherence Theory White (1970) traces this back, at least in character, to Leibniz, although Rescher (1973) makes Hegel the originator of the theory proper. See Rescher 1973 for a present day approach to this theory.

The Pragmatic Theory This is largely associated with William James. See his "Pragmatism's Conception of Truth" (1907).

The Semantic Theory This theory is or stems from Tarski's (1936, 1944) definition of truth for formalised languages.

The Redundancy Theory Ramsay (1927) originated this theory, claiming that It is true that P means no more than P.

The first task in treating truth and falsity will be to identify in terms of the model of the semantic apparatus what it is that can be true or false, i.e. what the truth bearers are. Second, will be to show how it is that a truth bearer can be held to be true or false. Third, will be the task of attempting to resolve that puzzling triangle of notions, truth, falsity, and negation. Finally, I shall look briefly at some other attitudes.

In this chapter, only non-analytic truth and falsity will be considered. A consideration of analytic truth and falsity will be given in the next chapter. There is, however, one aspect of the traditional view of analytic truth that must be touched on here. An analytic truth is often described as one which is true in virtue of its meaning alone, but this seemingly innocuous way of putting it weds meaning to truth by fiat and in the quite precise way I have defined meaning, this union must be suspect for the following reason: It is not clear whether some animals, such as squirrels, are meaners in the sense of the term employed here², but the odds seem to be against. Nonetheless, a squirrel has expectations or beliefs and these may be true or false - not just for an observer judging the squirrel's action, but for the squirrel itself:

² Part of the aim of general semantics as here construed is, of course, to set up the criteria on which such matters may be judged, but collecting the data to match against these criteria is no easy matter.

a squirrel does not continue to look for a hoard of nuts in the same place once it discovers there are none even though it once believed that there were nuts there. Since it appears that there is at least some doubt as to whether truth and meaning go hand in hand in all cases, it seems wiser not to make the notion of truth dependent on meaning. I shall, therefore, talk of analytic truths and falsehoods as being true or false in virtue of their internal relations. What it is that can have such internal relations, I now turn to.

4.0 Truth Bearers

What is it that can be true or false? An answer to this question is a prerequisite for making any real headway in the discussion of truth and falsity. Over the years, as O'Connor (1975 : 28) says, a number of answers to these questions have been offered including: beliefs, judgements, propositions, statements, sentences, utterances. The latter three can be dismissed as possibilities for primary truth bearers if it is granted that non-articulate animals and pre-articulate children can have true and false beliefs. For example, a squirrel hides a cache of acorns at a spot, x, and upon waking from hibernation mistakenly goes to look for the cache at spot y. The squirrel's expectation or belief that the cache is located at y is false and after arriving at y, the squirrel will be aware that it is false. To the

extent that sentences, statements, and utterances can be truth bearers, it would appear that they are so only derivatively and that they derive this capacity by expressing in some manner things which are the real truth bearers.

In considering judgements and beliefs, it is important to take as the candidate for truth bearer not the act of judging or believing but the content of the judgement or belief. Hence if Jane believes that Jill has red hair the possible truth bearer is "that Jill has red hair" and Jane's believing it or not makes no difference to its possible truth bearer status. A similar position occurs with the other attitudes; they, like belief and judgement are directed towards something, hence one always supposes, doubts, assumes, asks, SOMETHING. This something has traditionally been called a proposition, and it is but a short step, as Nuchelmans (1973 :2,3) notes, to see the content of a thought, say, "Jill has red hair" which is merely entertained in the mind without the entertainer taking any attitude whatsoever towards it, as a proposition: for why should a proposition stop being one just because no attitude is directed on it; indeed why should a proposition only exist in a single mind since any number of people might have the same thought and what sense could be made of this unless each of their thoughts had the same content? Thus the proposition became the immaterial truth bearer and despite many

problems³ remains perhaps the number one candidate for that title.

The approach adopted here is physicalist and, under such an approach, whilst abstraction is perfectly possible, such abstraction must always be reducible to its physical tokens or instantiations. On such a view, propositions could only be entertained as a type abstraction, and this it might be convenient to do, but this will not give the hard physicalistic answer concerning the truth bearers that is required unless attention is concentrated on the tokens of the type. I shall, therefore, view propositions as a higher-order abstraction than will be useful for the level of this inquiry and I shall consider them no further.

Whatever a truth bearer is, it must be something which can be held true and can be held false⁴ (analytic truths and falsehoods apart⁵). This seemingly banal⁶ requirement places,

³ See Nuchelmans 1973 for early theories of the proposition: O'Connor 1975, White 1970, and some papers in Pitcher 1964 for criticisms of the notion of the proposition and further references.

⁴ On a correspondence theory of truth every truth bearer will have an invariant truth value, but this does not alter the point being made since that point is that it must be possible to hold what is true false and vice versa.

⁵ To avoid irksome repetition, all references to truths and falsehoods in the rest of this chapter are references to non-analytic truths and falsehoods unless otherwise stated. It is to be noted that I observe the Kantian distinction between the analytic and the a priori. These categories may overlap but it is only the analytic which are referred to here.

⁶ Cf. Russell's (1912 : 70) claim that some truth theorists have so constructed their theories that a place for falsehood can only be found with the greatest difficulty.

in fact, a strong constraint on the nature of a truth bearer since it requires that it cannot be a feature of the truth bearer alone which determines whether it is to be held true or false, for if it were, one would infallibly know what was true and what false (barring errors in identifying the feature). If it is not a feature of the truth bearer alone which allows it to be held either true or false, then there must be something else which sanctions this. This something else might be some principle of coherence between the truth values of a particular set of truth bearers, as suggested by the coherence theory of truth, or it might be some principle of correspondence of a truth bearer with something else as suggested by the correspondence theory of truth. I believe that both these suggestions may in fact apply, but that in order to give coherence something to work with and to constrain the possible sets of truths and falsehoods over which it operates, some selection of basic but not unrevisable truths must be arrived at by some kind of correspondence mechanism. Therefore, there are now two questions to be answered, each answer constraining the other: "What are the truth bearers?" and, "What is the correspondence mechanism and with what is there a correspondence?"

The answers to these questions will either have to be found within the model of the semantic apparatus so far presented or extra pieces will have to be added to supply the answers. In fact, very little will need to be added to the existing model. It will be recalled that there are four

possible states for a collect to be in: (1) Neutral state. (2) Stimulated state. (3) Invoked state. (4) Both invoked and stimulated state. An invocatum is a collect or structure in a single state of invocation, and since all invocations are distinctive and ordered, invocata too are distinctive and ordered. The proposal is that the truth bearers are invocata. It will not be the case, however, that necessarily all invocata are truth bearers; there will be many invocata which are not suitable candidates for truth. Surprisingly, and perhaps disconcertingly, there will be many invocata which will be candidates for truth although these invocata will sometimes represent items of language which we do not ordinarily think of as being capable of being true or false. Such items will be such things as proper and common names, pronouns, adjectives, adverbs and indeed virtually any part of speech. This is simply the consequence of treating some truths as depending in part of some kind of correspondence. One could choose another name to distinguish between the case where a statement or proposition (in the ordinary sense) is true from that where fragments of these are true, but this would only introduce a distinction where none exists because the process of correspondence is uniform.

The mechanism of correspondence and what truth-candidate invocata are supposed to correspond to will be the subject of the next section. Here the case of possible non-meaners, such as the earlier example of the squirrel, needs to be examined

in the light of the claim that some invocata are truth bearers. First, for brevity and convenience it will be useful to have a term for those invocata which are capable of having a truth value. I call such invocata, representata and formally specify a representatum as:

- (1) Representatum. An invocatum capable in principle of having a truth value.

More will be said in the next section about what capable in principle means, but for the moment it can be noted that invocata that correspond to such utterances as questions, commands, war-cries, and the like do not seem capable of having truth values although parts of them may.

Thus far, talk of invocation has tended to concentrate on that brought about by the associative link between sub and non-sub. This concentration is understandable because it is this link which is the meaning link. However, there are many other associative links which do not involve subs and since it is absence of subs which distinguishes meaners from non-meaners, the use of these other associative links for invocation is important in allowing some non-meaners to utilise the notion of truth and falsity while retaining a single type of truth bearer throughout. For the squirrel, the invocatum equivalent to "Acorns at y" might have come into being through a chain of associations prompted by being hungry,

utilising past associations of satisfying hunger with acorns and of acorns being located at various places, etc. The details are not of importance here but what is is that the choice of representata as truth bearers does not preclude non-meaners from having and utilising a notion of truth.

4.1 How Representata Can Be Held True or False

Russell (1912 : 69) identified two different questions concerning consideration of truth and falsity: (1) What is truth (falsehood)? (2) What beliefs are true (false)? Concerning question (2), Russell thought it "...a question of the very greatest difficulty, to which no completely satisfactory answer is possible." (: 69). To question (1), Russell believed a clear answer could be given. Rescher (1973) claims that a theory which attempts to answer (1) is a definitional theory of truth, whilst one which attempts to answer (2), in giving a general means by which truths are sorted from falsehoods, is a criterial theory of truth. According to Rescher, the correspondence theory of truth is a theory par excellence of the definitional kind and the coherence theory of truth is a theory of the criterial kind.

Whilst a little will be said here of the definition of truth and of the criteria of its application, the main purpose will be to attempt an answer to a rather different question, viz. "What general mechanism is involved in a truth bearer

being held true or false?" To answer this, the more specific question, viz, "What is the correspondence mechanism and with what is there a correspondence?" of the last section must first be addressed.

A collect can be in one of four states. When the collect is invoked, it is an invocatum and it may, therefore, be a representatum. If it is a representatum, with what could it correspond as one step in attaining a truth value? The answer is, of course, quite obvious; it could correspond with the very same collect being stimulated, a stimulum. It will be remembered that a collect can be in both a stimulated and an invoked state at the same time. Hence a stimulum is the something with which a representatum must correspond if it is to meet the correspondence⁷ requirement of being true. What then of the correspondence mechanism, that which compares in some manner the representatum and stimulum to check whether they correspond? No such mechanism is in fact required, for identity of both the representatum and the stimulum is given by the locus of the collect and both stimulation and invocation are distinct states. There is no more need to postulate something's doing the comparing than there is to require some external connection between a poker being made of steel and its being hot: the poker's being made

⁷ Here I am talking only of basic truths. Many others will be arrived at by inference. Much inference will involve sense relations and this will be discussed in the next chapter.

of steel and, at the same time, being hot is just the state it is in, just as in the same way a collect being both invoked and stimulated is in that state of being invoked and stimulated.

Where a representatum and stimulum are in correspondence with each other, I shall say that they match or are matched.

Specifically, a match is defined as follows:

- (1) Match A representatum matches or is a match if⁸ its time index, if any, agrees with the occurrent time of a stimulum and its contents, including any augmentation, are contained in that stimulum except insofar as specified otherwise by negative, quantifying or intensional⁹ elements in the representatum.

To make (1) comprehensible it is necessary to explicate some of the terms which occur in it. The time index of a representatum is the time it represents. Usually, in natural languages, this is indicated by tense or time adverbials, but there are cases where the time index is omitted quite regularly, for

⁸ If could possibly often be strengthened to iff ("if and only if") in this and many definitions in this and the following chapter, but I shall refrain from doing so, being content with the lesser claim of the conditions stated being sufficient rather than necessary as well.

⁹ Many verbs take intensional objects. For example, the truth of the utterance "Jane is looking for a unicorn". depends not at all on there being a unicorn.

example, in a number of languages in the copula construction. In such cases, it seems likely that either a default time index applies or some mechanism is at work to supply this from the linguistic or non-linguistic (or both) context. Lack of an explicit time index is, however, much more widespread in spoken language than the grammars of languages would generally allow, and utterances of one or several words occur frequently without an uttered time index. A time index is not essential for matching since an unspecified time is consistent with any time, but a specified time index does reduce the matching possibilities.

It will be recalled that all invocata and stimulata are ordered. It is natural and useful to assume that the dimension of ordering is one of time. Hence each stimulum is marked, as it were, with the time at which it occurred, its occurrent time. The first requirement of matching is that the time index, if any, of the representatum agrees with the occurrent time of the stimulum. This does not mean that the time index has to be exactly the same as the occurrent time. Rarely will this be the case because the time index is a very gross measure of time, whereas occurrent time can be very finely graded. What is meant by agrees in (1) is that the occurrent time is consistent with the time index. Hence the time index may simply refer to a time past in relationship to the occurrent time of the representatum. In such a situation, the occurrent time of a stimulum will

agree with that time index if it is earlier than the occurrent time of the representatum.

By augmentation is meant any stimulata or invocata which are associated with a representatum prior to its trying to be matched. Some items of language have minimal meaning when taken out of any context, so need a great deal of "filling out" or augmenting. Of particular interest are non-unique proper names. Suppose somebody utters (2) to me in conversation.

(2) Jane put a book on the table.

On the assumption that I know several Janes, I am in no position to consider the truth or otherwise of an utterance of (2) until I can fix the identity of the particular Jane. This I will normally do by various means: who my interlocutor is, the previous conversation, the general context etc. If none of these help, I shall probably ask the speaker for more information. Any information I gain about Jane will be in the form of invocata or stimulata and these will be associated with the collect corresponding to Jane in the representatum corresponding to (2). Any collect of a representatum may be augmented¹⁰ in this way, and such augmentation has the effect of restricting the possible matches of the representatum.

¹⁰ The reader will realise that augmentation is the means by which what is often called the discourse model is to be built.

To see that this is so, consider Figure 4.1.0, in which some augmentation has been added to (2).

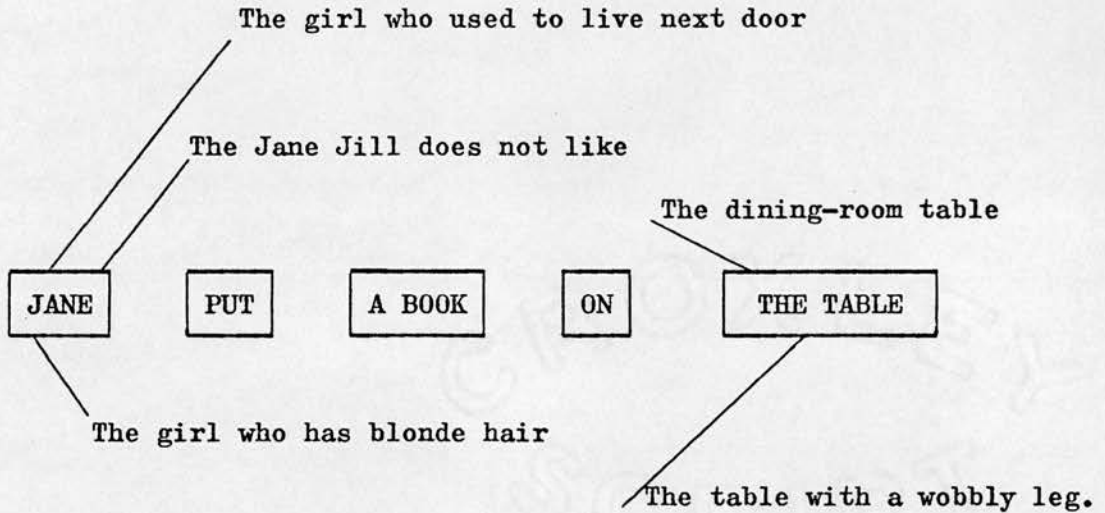


Figure 4.1.0

Why particular augmentations are made is an interesting question, but it is not one that I address here or, indeed, need to address, although contextual information, both non-linguistic and linguistic, would seem to be important.

A representatum of the sentence in (2) augmented as in Figure 4.1.0 greatly reduces the matching possibilities. Now, Jane has to be the girl who used to live next door, has blonde hair, and is not liked by Jill. The table is also constrained by augmentation, and now instead of being any old table it has to be the dining-room table with the wobbly leg. Augmentation is perhaps more usual in the case of proper names and definite noun phrases, but it is not restricted to them and may, in fact,

take place on any item in a representatum as the wide definition of augmentation in (3) shows.

(3) Augmentation The association of any stimulatium or invocatum with an invocatum.

The contents of an invocatum, stimulatium, or representatum are its collects and any structurally significant arrangement of those collects. Thus for a stimulatium and representatum to share the same contents, it is necessary not only that they have the same collects, but also that those collects are associated in the same structurally significant way. However, the matching specification does not require that the representatum share the same contents as the stimulatium, but only that the contents of the representatum are CONTAINED in the stimulatium unless otherwise specified by negative, quantifying, or intensional elements. The requirement that the contents of a representatum be only contained in as opposed to shared with a stimulatium arises because the "shared-with" demand seems to be far too strong to be plausible. That there would be a stimulatium that shared the contents of a particular representatum without any deviation at all seems most unlikely, and the upshot of this would be that very few, if any of what I have called basic truths could exist because the matching requirement would rarely be met.

To explicate the notion of "contained in" as used in

(1), I tentatively introduce what I shall call the reduction inference. This is a tentative proposal because the consequences of the reduction inference are very broad and a long and detailed examination of them would be required before one could promulgate the reduction inference as anything more than tentative. Be this as it may, the reduction inference or something like it seems to be required if the matching process is to be seen as plausible.

(4) The contents of a representatum are contained in a stimulum if either:

(a) The representatum and stimulum share the same contents.

or

(b) The contents of the stimulum reduce by the reduction inference to those of the representatum.

(5) Reduction Inference

(i) Any simple collect (i.e. one not involving significant structure) of a stimulum may be reduced to any part(s) of that collect.

(ii) Any stimulum may be reduced to any continuous part of that stimulum.

(iii) If a is any argument of a stimulum or is an argument included in an argument of a stimulum, and a includes another argument, b, then a may be reduced to b alone or

to b and any or all of the relators which include b, provided that a does not include another argument, c, which neither includes b nor is included in b.

- (iv) Any stimulum or argument of a stimulum or argument included in an argument of a stimulum which contains a non-first argument may be reduced to the first argument and its non-first argument relator alone.

The aim of the reduction inference is to preserve implications of a stimulum to which it is applied while ensuring that no false implications are generated. If one considers the sentence in (2) (repeated here for convenience), then it can readily be seen that the experience, and hence the stimulum, which verifies a statement of this sentence will be vastly richer in information than the statement.

- (2) Jane put a book on the table.

For example, if one witnessed Jane putting the book on the table, then as part and parcel of this experience, one is likely also to have noted Jane's age, her appearance, her dress, the size of the table, its colour, etc. A statement of (2), however, says nothing about all of these things, and by some means the stimulum corresponding to having the experience of witnessing Jane putting the book on the table must yield as a true implication that Jane put a book on the table. The suggestion is that the reduction

inference or something like is used to extract the implication from the stimulatun and to remove the extraneous information.

The first two parts of the reduction inference ((5i) and (5ii)) do not alter structure and, therefore, are quite straightforward. (5ii), for example allows (6) to be reduced to (7) since (7) (on the arrangement of non-subs assumed here) will form a continuous part of the stimulatun corresponding to (6).

(6) Jill went to town and Jane had a bath.

(7) Jane had a bath.

The second two parts of the reduction inference ((5iii) and (5iv)) are less straightforward because they allow for alterations to structure. Central to these inferences is the notion of inclusion, and inclusion and, for completeness, immediate inclusion are defined as follows:

8. Inclusion A relator, r , includes its argument(s), and if a is any argument included in r , then r also includes any argument(s) of a .

9. Immediate Inclusion A relator immediately includes its argument(s) but not the argument(s) of its argument(s).

Inclusion and immediate inclusion are most easily understood if it is appreciated that they are equivalent to dominance and

immediate dominance in tree graphs. Hence in Figure 4.1.1, a_1 immediately includes a_2 and a_3 , but includes all of a_2 to a_6 .

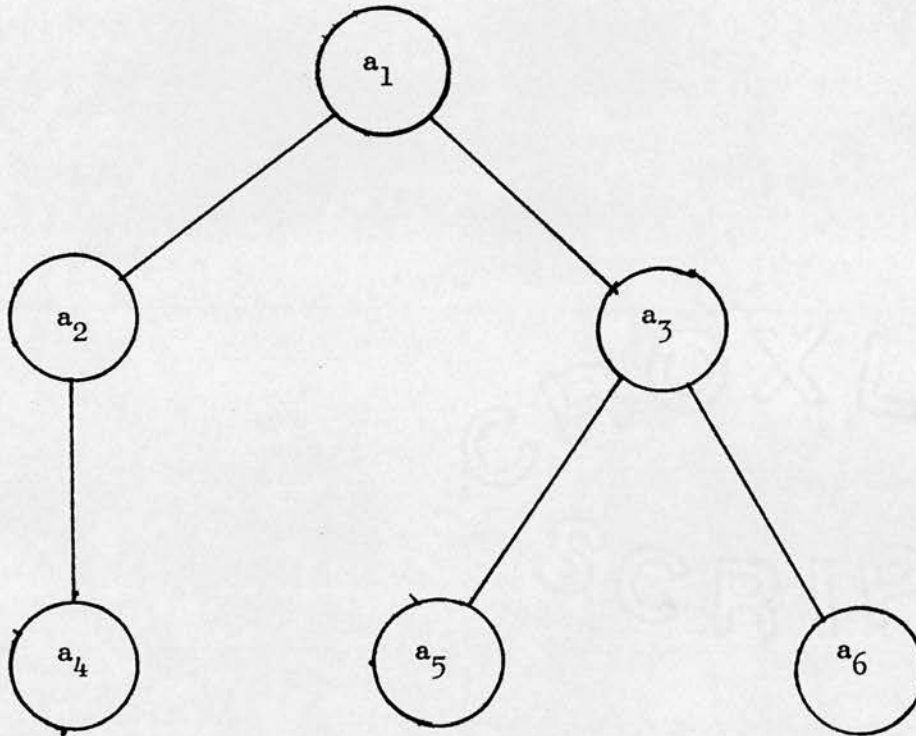


Figure 4.1.1

Reduction inference (5iii) allows arguments to be simplified. So it allows (10) to reduce to (11) because (11) is a true implication of (10).

(10) Big red reading book.

(11) Big book.

The somewhat complex nature of (5iii) arises on two counts:

First, it allows argument simplification at any depth of inclusion.

Second, it has a provision to stop false implications being generated. Both requirements can be readily seen on the tree graph depicted in Figure 4.1.2.

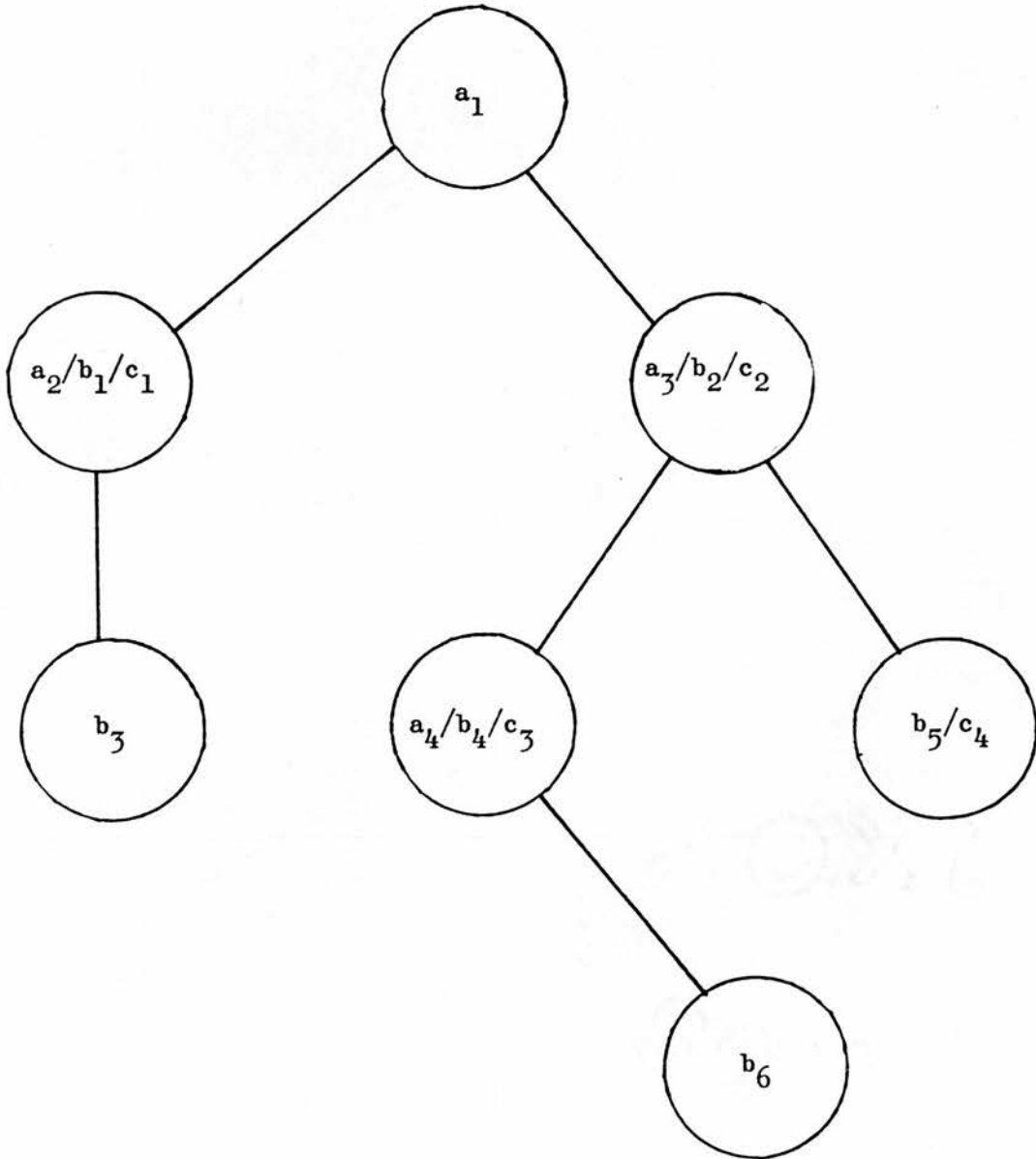


Figure 4.1.2

It will be noticed that a arguments occur in the tree wherever a node dominates another or others. This allows inference (5iii) to

operate at any depth of inclusion providing there is an including argument present. It will also be noticed that a c argument occurs wherever branching does. (5iii) does not permit a_1 to reduce to b_1 or b_2 because in each case there is a c argument included in a_1 which neither includes the relevant b argument nor is included in it. Such a restriction is necessary to prevent the reduction of (12) to (13) since clearly (13) is not an implication of (12).

(12) Jane paints the door of the house.

(13) Jane paints the house.

One final complication in (5iii) is that it permits, where the conditions are met, a to be reduced to just b or b plus all or any of the relators which include b. This allows the following possibilities with respect to an argument corresponding to (14).

(14) This big red reading book.

- | | |
|----------|----------------------|
| (15)(a) | BIG RED READING BOOK |
| (b) | RED READING BOOK |
| (c) | READING BOOK |
| (d) | BOOK |
| (e) THIS | BOOK |
| (f) THIS | READING BOOK |
| (g) THIS | RED READING BOOK |
| (h) THIS | RED BOOK |

- (i) THIS BIG BOOK
- (j) THIS BIG RED BOOK
- (k) THIS BIG READING BOOK
- (l) BIG RED BOOK
- (m) BIG READING BOOK
- (n) BIG BOOK
- (o) RED BOOK

(Where no c arguments are involved, the number of possibilities may be calculated by taking n as the number of relators and applying the formula n^2-1 . Hence in the case of (14) there are four relators so $n = 4$, giving $4^2-1 = 15$.)

It will be recalled that a relator has its argument-places, if more than one, ordered. One may talk, therefore, of the first argument-place, second argument-place, and so on. Derivatively, one can also talk of the first argument, the second argument, etc. to mean the argument occupying the first argument-place, the argument occupying the second argument-place, etc. respectively. Reduction (5iv) works with first and non-first arguments, specifying that any stimulum or argument in a stimulum containing a non-first argument may be reduced to the first argument and the relator of its non-first argument alone. The relator may then be removed by (5iii) if required because once a relator is reduced to having just one argument, it may be reduced to that argument. It is important here to distinguish between argument-places, which are a permanent

feature of a relator, and arguments, which are temporarily associated with those argument-places. The proviso on reduction (5iii) applies only to arguments.

Taking Figure 4.1.3 to represent a stimulatium corresponding to "Jane painting the door of the house on the hill", with the arguments shown on the blunt end of the arrows and the argument places of the relators numbered, reduction (5iv) permits the reductions shown at 4.1.4, 4.1.5, and 4.1.6, but blocks those shown at 4.1.7, 4.1.8, and 4.1.9. This is the desired result since Jane painting the door of the house is not Jane painting the house or Jane painting the door on the hill or Jane painting the hill. The arrangements of arguments and argument-places shown in these figures are only possible arrangements. There are other possible arrangements for most of the figures and it is not claimed that the arrangements shown are necessarily correct for the particular example. Where by correct I mean something like "corresponding to the actual semantic structures built by meaners". Of course, some arrangements might invalidate the reduction inference and this must be borne in mind when contemplating alternative arrangements.

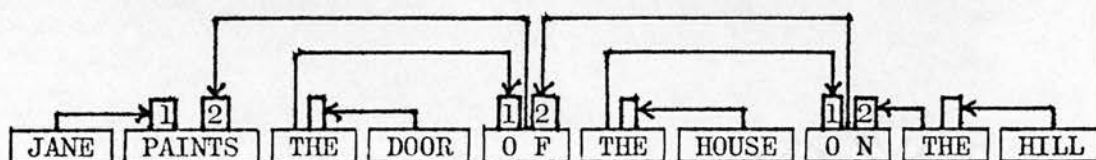


Figure 4.1.3

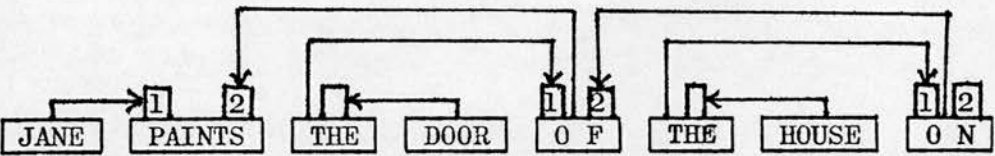


Figure 4.1.4

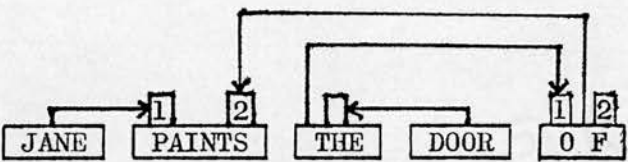


Figure 4.1.5

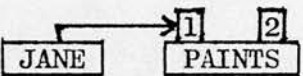


Figure 4.1.6

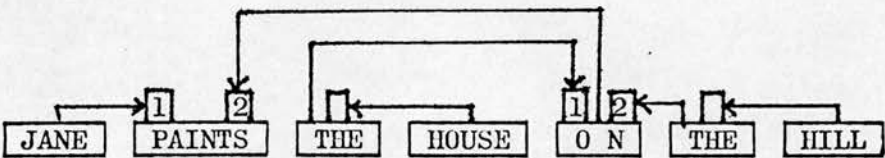


Figure 4.1.7

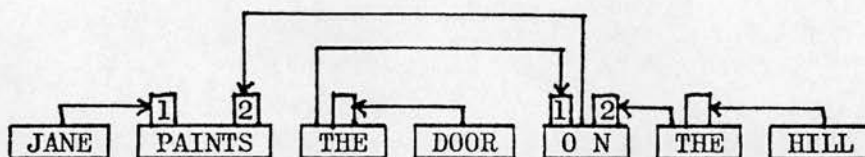


Figure 4.1.8

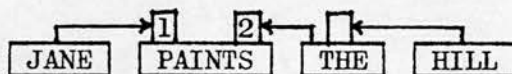


Figure 4.1.9

To arrive at Figures 4.1.7, 4.1.8, and 4.1.9, reduction (5iii) has been used to remove the unwanted relators.

Matching a representatum is the first step in holding it true. The need for the second step arises because of the possibility of hallucination and illusion. Suppose on a particular day that I have the experience of seeing a red car at a certain point on a particular road, then such information, mediated by various senses and processes perhaps, will be held as a stimulum. In view of having this stimulum, I will hold true the representatum corresponding to I saw a red car at such and such a place at such and such a time so long as I believe my experience to be veridical. But suppose now that several people whom I trust state that they were at that particular spot at the relevant time and

it was a yellow and not a red car, then I should be inclined in such a circumstance to doubt the veracity of my senses; perhaps it was an illusion or I hallucinated or I put together the car and a colour which I was experiencing at that time but was not the colour of the car. The latter is always a possibility since stimulations may be associated in any way. If in the end I no longer believe my experience was veridical, then I shall no longer hold true the representatum that I saw a red car at such and such a place. The point of this example is this: If I can change my mind about a possible basic truth in the light of evidence about the veridicality of a stimulum, then it would seem that holding any representatum true rests on some premiss that any stimula (there could be more than one in the case where inference plays a key role) invoked are assumed to be veridical. This premiss or condition, as I shall call it, is probably not to be seen as a positive test to be passed every time something is matched, rather it is a negative condition in that it only comes actively into play when something occurs to cause doubts¹¹ about some stimulum or outright contradiction between two stimula. Whether the condition is a positive test or merely a usually unchallenged assumption¹², it remains a condition. There may

^{11,12} The use of such terms as doubt and assumption should not be mistakenly thought here to require something over and above the semantic apparatus. I use this terminology because it is in these terms that we speak of humans and some other animals, but they can be replaced with neutral ones. One can think of a process continuing until the conditions for its continuance are no longer right.

be other conditions on the truth of representata and it will be useful to have a convenient way of collecting these conditions together and of referring to them collectively. I shall, therefore, talk of the set, Delta, as being the set of conditions that must be met, passively or otherwise, and over and above any matching, when a representatum is held true. Delta is thus specified as follows:

- (16) Delta The set of conditions, if any, which must obtain, irrespective of matching, if a representatum is to be held true.

We are now in a position to specify formally what it is for an associator to hold something true in a basic sense. Before giving such a specification, however, it will be as well to reflect for a moment on why the talk is always of holding something true or false rather than something's being true or false. If the requirements set out in (17) were sufficient to guarantee truth, then, of course, one could speak of a representatum as being true, but there is no reason to believe that they are sufficient in this sense: it would be quite remarkable if they were, given the latitude for error which inevitably they contain. Rather (17) is a claim about what is involved when a representatum is held true; it is not a claim about a representatum's being true. To say what is involved in a positive representatum's being true is to give a definition

of truth in Rescher's sense mentioned above. Essentially, such a definition will amount to this: A positive representatum is true if it matches a stimulum and that stimulum is/was caused by external objects having properties or standing in relationships to each other which are isomorphic to the structure of the stimulum. This definition will only be adequate for basic truths. For those truths involving inference, including inductive inference, some modification is necessary.

The formal specification for holding a representatum true, given at (17), is restricted in two ways. First, it is restricted to positive representata, i.e. to representata containing no negative elements. Negative representata will be discussed in the next section. Second, it is restricted to basic representata, i.e. representata that do not require anything beyond the reduction inference, matching and meeting the requirements of Delta to be held true.

- (17) Hold True A positive basic representatum is held true if it can be matched and satisfies the conditions, if any, of Delta.

So far, I have been concerned with what it is to hold a positive representatum basically true, now I turn to what it is to hold a positive representatum basically false. What has been said about holding a positive representatum true is, I believe,

largely uncontroversial. In contrast, whatever is said concerning holding a positive representatum false will inevitably be controversial because it involves taking a position in the debate on presupposition. Frequently in the discussion of presupposition, negation is brought in almost at the very beginning. This would be satisfactory and useful if negation was a clearcut uncontroversial matter in its own right which shed light on the presupposition debate; however, negation is as controversial a topic as presupposition and to bring in negation to throw light on presupposition is to risk increasing the gloom instead of lightening it. Negation, therefore, will be left until a basic position on presupposition has been discussed and adopted, and all consideration in the first instance will concern positive representata only.

There are now many twists and turns to the presupposition debate, but its essential character can still be grasped from a brief sketch of the positions of the chief historical protagonists: Frege, Russell, and Strawson¹³.

In his article, "Über Sin und Bedeutung" (1892), Frege held that the reference of a declarative sentence was its truth value, either the TRUE, or the FALSE. Hence it follows that if a sentence lacks a reference, then it lacks a truth value. Frege claimed that many sentences lacked a reference

¹³ Neither Russell, nor Strawson used the term presupposition in their original work in this area. The term was introduced at a later date by Strawson.

because parts of them lacked a referent and gave as an example one concerning Odysseus:

The sentence "Odysseus was set ashore at Ithaca while sound asleep" obviously has a sense. But since it is doubtful whether the name 'Odysseus', occurring therein, has reference, it is doubtful whether the whole sentence has one.

(From a translation by Black. Geach and Black 1952: 62)

Thus for Frege, if there was no such person as Odysseus, then the sentence¹⁴: "Odysseus was set ashore at Ithaca while sound asleep" is neither true nor false. The implications of Frege's claim were not perhaps fully appreciated until Strawson developed them much later.

In an article entitled "On Denoting" (1905) and later in the fourth of his lectures on the philosophy of logical atomism (1918), Russell considered the conditions under which a sentence containing a proper name or definite description was true or false. Essentially, Russell's proposal was that a sentence containing a proper name or definite description was replaced by one or more propositional functions, i.e. a proposition containing a variable. Russell's well known example is shown in (18).

(18) The present king of France is bald.

¹⁴ Neither is the utterance of such a sentence. Following Strawson, I accept that properly speaking it is the uses of sentences which are true or false and not the sentences themselves.

Russell's claim was that (18) really consisted of the several propositions set out in (19).

- (19) There exists someone, x , such that:
- (a) x is a king of France now.
 - (b) x is bald.
 - (c) For all y if y is a king of France now then $y = x$.

For (18) to be true it was necessary that all of (19) should be true. But what was if for (18) to be false? Russell said that (18) could in fact be false in two ways. First, it was false if the present king of France was not bald. Second, it was false if there was in fact no present king of France. The second way of being false follows from Russell's insistence that in asserting (18) one is asserting the conjunction of the propositions in (19). Russell, then, is claiming in contradistinction to Frege that if part of a sentence lacks a referent, then that sentence does still have a truth value, and that truth value is "false". That Russell thought it quite wrong to conclude that such a sentence lacks a truth value can be seen from the following passage:

Therefore unless you understand how a proposition containing a description is to be denied, you will come to the conclusion that it is not true either that the present king of France is bald or that he is not bald, because if you were to enumerate all the things that are bald you would not find him there, and if you were to enumerate all the things that are not bald, you would not find him there either. (1918 : 251)

Forty-five years later, it was again claimed that a statement of (18) was in fact neither true nor false if there was no present king of France. This time the claim was made by Strawson (1950). Strawson, contra Russell, held that a statement of (18) did not entail an existence claim about the present king of France, but rather it was a prerequisite of that statement's having a truth value that there be a present king of France. If there was no present king of France then a statement of (18) was neither true nor false.

Strawson's claims about this prerequisite, what he later called presupposition, have given rise to a great deal of interest and debate which has not subsided. Closer examination has brought to light all kinds of difficulties and matters seem to stand further from a satisfactory resolution than they did when Strawson first produced his suggestions. One reason for the persistency of Strawson's proposals and the fervour with which they are taken up and built upon by others is, I suggest, due to their intuitive appeal. If one is asked the truth value of a statement of (18) and one is not aware of the republic status of France, then one is a little taken aback to be told that the statement of (18) is false because there is in fact no present king of France. This being taken aback lends intuitive support to the idea that there is something here to be explained, and since Strawsonian accounts offer such explanations, they utilise this appeal. I shall offer an alternative explanation shortly, but first I shall

consider another example. For this, I use a variant sentence.

Consider (20):

(20) The king of France visited the exhibition.

Under which of the following circumstances is a statement of (20) false?

- (21)(a) There was a king of France and an exhibition but the king did not visit the exhibition.
- (b) There was a king of France, but no exhibition.
- (c) There was no king of France, nor an exhibition.
- (d) There was no king of France, but there was an exhibition.

Russellians and Strawsonians are agreed in the case of (21a): a statement of (20) is false if the circumstances of (21a) obtain. Russellians take the same view with regard to all the other circumstances. Strawsonians, on the other hand, hold a statement of (20) neither true nor false in circumstances (21c) and (21d) and there is a mixture of views concerning the situation with regard to (21b) (cf. Strawson 1971, Cooper 1974, Fodor 1979). Pace Strawson and followers, I

think that Russell was right and a statement of (20) is false under all the circumstances of (21). If this view is correct then two things call for an explanation: (a) How is it that an utterance of (20) can be false under such disparate circumstances? (b) How can one explain the unease, the intuitive unease to which Strawson's view appeals, that temporarily occurs in assigning truth values in circumstances (21b), (21c), and (21d)?

In answer to the first question, it seems to me to have great plausibility that a statement is possibly true in a basic sense if it corresponds to some situation or fact. This, of course, is the core of the correspondence theory of truth and it is beset by all kinds of problems once one starts to investigate what corresponds means and what facts are. Within the model of the semantic apparatus, it has, I believe, been possible to give an account of the notion of correspondence and of what it is that there is a correspondence with which avoids these difficulties. A representatum is a claimed representation of some situation or thing. If it fails to match in any way at all, then it is a false representation, a false representatum. That a representation is false if it fails in fact to represent is, I believe, a fundamental tenet for which very good grounds are needed if it is to be given up. Now whilst it would be perfectly possible to distinguish different ways of a representatum's failing to match, it is

not clear that there are any transparent¹⁵ grounds on which to categorise the various ways of a statement's being false and, therefore, of a representatum's being false. In such circumstances it is perhaps better not to make any distinctions where no distinctions are clear. An utterance of (20), then, can be false under the disparate circumstances listed in (21) because it purports to represent a situation which does not obtain in any of those circumstances.

With regard to the second question, it does seem to me that even though one rejects Strawson's basic view, one is still left with the feeling that he has hit on something. The question is: "What?" There are in fact two things to be explained. The first is the intuitive appeal of Strawson's explanation in some cases. The second is the lack of such appeal in other cases. To explain this varying appeal, Strawson himself has spoken of "centres of interest" (see footnote 15), but such an explanation explains little. Among the phenomena that we are concerned with are the following:

¹⁵ Strawson (1971) talks of various degrees of "squeamishness" and "centres of interest" to explain the varying acceptability of a statement's having a truth value where there is radical reference failure, i.e. a failure to refer by use of an identifying referring expression (: 75). So, for example, Strawson allows that "The king of France is bald" is false despite radical reference failure of the identifying referring expression: The king of France, when it's in reply to the question: "What bald notables are there? (: 91, 92). N. Burton-Roberts discusses some of the implications of this view in "Thematic Predicates and Non-descriptive Definition" (unpublished paper).

- (22) The king of France is bald
- (23) The king of France visited the exhibition
- (24) The exhibition was visited by the king of France

Strawson maintains both that as a plain statement (22) is without a truth value if there is no king of France and that (22) is false as a statement in response to the question: "What bald notables are there?" (1971 : 91, 92) if there is in fact no king of France. In the cases of (23) and (24) the appeal of the presuppositional account varies as one varies the circumstances. If there is no king of France but there is an exhibition, then the appeal of an absence of truth value seems much stronger in (23) than in (24). What one would like is some unified account which explains both the basis of the intuitive appeal of absence of a truth value in some cases, and the high variability of this appeal.

It has long been noted¹⁶ that the use of the definite article in languages like English indicates that the hearer should in some way be already familiar with what the expression in which the definite article occurs describes. Building on this, Heim (1982) develops the notion of what she calls file change semantics. With regard to definite and indefinite noun phrases, what this essentially amounts to is this: We

¹⁶ Cristophersen 1939 seems to have been one of the first to be fully explicit about this.

are to envisage information as being stored on file cards (metaphorically speaking). The use of a definite noun phrase will then indicate that a file concerning what is being described already exists. The use of an indefinite noun phrase will indicate that a new file is to be opened. In file change semantics, then, the use of a definite noun phrase presupposes that a file exists. If such a file does not exist, then matters can proceed no further, and no question of truth or falsity can arise. The approach is, therefore, Strawsonian to that extent. For a statement in which definite noun phrases occur to have a truth value, it must, according to Heim, be felicitous, i.e. all of its definite noun phrases must have pre-existing files or file cards. As Heim herself notes, given that a file is somehow in the head, many uses of definite noun phrases do not presuppose a file in this sense. She quotes Hawkins (1978) as listing eight uses of definite noun phrases, only two of which fit the requirement of a pre-existing file. To overcome this difficulty, Heim introduces the notion of accommodation. Quite simply, accommodation allows a file card to be created if there is a failure of felicity due to its non-existence. This proposal is not so ad hoc as it appears because it allows space for environmental context and inference to operate in creating the file card. So, for example, Heim quotes the case of an utterance of (25),

(25) Watch out, the dog will bite you (: 371)

said while walking up a driveway to a house. There is no dog in sight and the hearer has no previous knowledge of there being a dog at the house. The utterance of (25) fails the felicity condition simpliciter because no file card exists for the expression the dog which is contained in it. However to overcome this, accommodation can be used and a new file card created containing the information, "is a dog somewhere close by" (: 372).

Heim's ideas are interesting, but they seem to have two major flaws. First, they do not distinguish between occurrences of definite noun phrases in different positions. Hence they add nothing by way of explanation to the phenomena which Strawson calls centres of interest except with regard to an utterance of (22) in response to a question. In this case, the question itself could create a file card in the sense of setting up a file on notables that are bald. Alternatively, accommodation could be invoked to provide the file card. Second, however, is that accommodation is so powerful that it fails to be explanatory in the sense of giving a reason why it should be used in the case of (22) when uttered as an answer but not in the case of (22) uttered by itself.

Heim's files and file cards can perhaps best be seen as analogues of representata including the possibility of augmentation. And it is augmentation, I believe, which holds the key to a uniform account of the phenomena discussed

above. The suggestion is this: names and most uses of the definite determiner have as part of their meaning that they ought to be augmented, i.e. that there should be some other information available and this should be added to them. I make no apology here for introducing another Latinism as a new term to cover those representata or parts of representata which correspond to proper names and definite referring expressions used in a definite way. These I call augmentanda, the term meaning "those which should be augmented" in Latin.

An augmentandum is then a collect or structure of collects which has the property of initiating a search for augmentation. In the case of proper names, one may assume this to be an inherent property of their corresponding collects. In the case of definite referring expressions, the property of requiring to be augmented, like that of the particulariser, seems to be inherited from the definite article¹⁷.

Augmenting a representatum, will normally cut down the search space that needs to be looked at in order to obtain a match. Augmentation puts extra conditions on the possible matches and thus eliminates many non-possibles. However, augmentation is not restricted to augmentanda. Parts of representata corresponding to almost all other parts of statements may also be augmented, especially those corresponding

¹⁷ This raises difficulties in languages like Latin that do not have articles. Heim suggests that in such cases an ambiguity exists between the definite and indefinite meanings (1982 : 267).

to indefinite noun phrases. It is nonetheless the case that augmentanda alone have the property of requiring a search for augmentation and it is this which can be used to explain the notion of Strawsonian presupposition and its related phenomena.

It is reasonable to suppose that some more or less efficient algorithm directs the search for matches of representata. This algorithm does not have to be seen as some explicit separate instruction mechanism, it might just be a consequence of the mechanism of invocation. Usually, though not invariably, before such an algorithm begins to operate one would expect that any instructions that were part of the meaning of an expression would be acted upon and completed. One such type of instruction is, as we shall see in the next section, concerned with negation, another could be the requirement associated with being an augmentandum that it should (not must) be augmented. Suppose now that the search for augmentation fails or is only partially successful, then the move on to the matching algorithm will be inhibited because the demand for augmentation remains. Such frustration of the matching algorithm caused by a prior requirement to find a positive augmentation could well explain the intuitive appeal of the idea that there is some kind of a presupposition and that it is false. However, the matching process is not dependent on augmentanda as witness the fact that a truth value can quite readily be assigned to utterances containing nothing but indefinite noun phrases as, for example, in an

utterance of (26).

(26) A man once bit a dog.

This is not to say that augmentation does not take place in such cases but, rather, to say that it need not.

The claim thus far is this: Built in to augmentanda are mechanisms which initiate searches for augmentation. If such searches are frustrated because augmentation cannot be readily found then this inhibits the move to attempted matching. Such frustration and inhibition is the basis for any intuitive feeling that an augmentandum presupposes, rather than entails, the existence of a match, and hence that it presupposes the existence of a referent.

It will now be useful to recap and expand on some of the phenomena that the augmentandum proposal is claimed to explain. First, in Strawson's view, in the context of (27) (27b) is false and not lacking in a truth value. What this amounts to in my approach is that (27b) in its context will inspire less strangeness than (27b) out of the context of (27) when it is given a truth value despite the assumption in both cases that there is no king of France.

(27)(a) What bald notables are there?

(b) The king of France is bald.

I think that this difference in strangeness, to the extent that such strangeness exists, can be accounted for if it is borne in mind that the augmentandum corresponding to the noun phrase the king of France in (27b) and in the context of (27) has available some information for augmentation, viz. that the king is a notable. Now, of course, that a king is a notable is a matter of sense relations and is, therefore, always available as augmentation, but its status grows given that it is in accordance with the given information of the question. Sense relations will be considered in the next chapter.

Second, as noted above, there are a mixture of views concerning the truth bearing status of (23) (repeated here for convenience) in the case where only one of the referring expressions actually refers.

(23) The king of France visited the exhibition.

Strawson (1971) claims that whether an utterance of (23) has a truth value or not depends on whether the expression that does refer is theme. If it is, then the utterance of (23) will have a truth value, if it isn't then it will not.

Fodor (1979) argues in contrast that if either referring expression, whether theme or not, refers, then an utterance such as (23) has a truth value. Cooper (1974) takes yet a different position, arguing that the referring expression

which actually refers is the theme of the utterance wherever it may occur.¹⁸

It was noted in the case of examples (23) and (24) that the intuitive feel concerning truth value was somewhat different in the two cases where the assumption for both was that there was an exhibition but no king of France. Now in either case on the approach taken here utterances of (23) and (24) can have a truth value, but some explanation is called for concerning the different intuitive feel concerning a truth value which they seem to call forth. Suppose that in a particular representatum there are two augmentanda. Now, assuming linear order of information presentation (as is found in all natural languages with the possible exception of some prosodic features) and real time processing, one of these augmentanda will be invoked first (barring the cases of mishearing and misunderstanding). It just makes good operational sense to assume that augmentation will normally commence on that augmentandum first. Once an augmentation has been found for the first augmentandum, there is much less need for an augmentation of the second since if a match can be made for the first, it will quickly become apparent whether the second figures in the matching stimulum. But suppose that the first augmentandum cannot be augmented, then the

¹⁸ Burton-Roberts in "Implications of the Pragmatics of Non-Descriptive Definition" (unpublished paper) argues that both Fodor's and Cooper's positions are in fact incoherent.

process becomes frustrated and is inhibited from moving on.

Thus, the general claim is this: Normally, if the first augmentandum that is invoked in a representatum fails to be augmented then there is a stronger intuitive feeling that the corresponding utterance's having a truth value is odd than is the case where the first augmentandum is augmented but the second not. Hence, assigning a truth value to an utterance of (23) should feel much stranger than assigning one to an utterance of (24) in the situation where there is no king of France and, granted always, that one has such an intuitive sense of strangeness in the first place.

The departure point for the above discussion of presupposition was the consideration of what was involved in a positive representatum being false. At the bottom of my concern to explain presupposition in a way which avoids any of its effects on the truth value of a representatum was the desire to preserve the notion that for a representatum to be held true in a basic sense, it had to, as a first step, represent some situation (mediated by a stimulum). If, to the contrary, a representatum fails to represent (to match) then it is held as a false representation and hence a false representatum. In actual fact, as with being held true, it is necessary to allow for the possibility of additional conditions to apply to a representatum's being held false. Such conditions might include the (passive?) satisfaction that sufficient information in the form of

augmentation was at hand for clearly establishing a non-match. In parallel to the set Delta, containing conditions over and above the matching requirement for a representatum to be held basically true, there will, therefore, be a set Gamma, being the set of any conditions that must be satisfied in holding a representatum as basically false over and above the non-matching requirement. In parallel with Delta, Gamma is specified as in (28).

(28) Gamma The set of conditions, if any, which must obtain, irrespective of failure to match, if a representatum is to be held false.

For basic positive representata, the formal specification for holding a representatum as false will then be as in (29).

(29) Hold False A positive representatum is held false if it cannot be matched and the conditions of Gamma, if any, are satisfied.

In this section, I have been concerned with what is involved in holding a basic representatum true or false. By basic representatum I mean a representatum which requires no inferences beyond the reduction inference and any inferences involved in Delta and Gamma to establish whether it is to be held true or false. Whilst basic representata have a special

place in the scheme of things being proposed here, it would be wrong to view the difference between basic representata and non-basic representata as being a fundamental difference in kind. It is just the case that for contingent truths basic representata are nearer the beginning of the inference chain than are non-basic representata. Viewed objectively and even though the meaner may not be aware of it, there is always an inference involved in assigning cause to an experience.

It is to be noted that representata are divided into basic and non-basic not according to their intrinsic properties (although these may have some consequences), but according to how they are held true or false. It is therefore possible that a representatum may be non-basic on one occasion and basic on another.

The holding of non-basic representata true or false will involve various kinds of inference. A representatum containing universal quantification, for example, will involve inductive inference unless the quantification is restricted to an observable domain. Many other non-basic representata will involve inferences based on or partly based on the sense relations to be discussed in chapter 5.

In the requirement for a match given in (1), certain exceptions to a match were allowed if they were specified in a representatum. The next section will be specifically concerned with that exception involving negation. The other two exceptions, concerning quantification and intensional

contexts, I shall not treat in any detail. With regard to quantification, it is quite clear that modification is necessary to allow for the collecting together of more than one stimulum in order to obtain a match. For example, it is distinctly possible that the representatum corresponding to an utterance of (30) involves three separate stimula.

(30) Three women were wearing red hats.

In addition to intensional cases like that of (31), where the truth of the statement is not materially affected by there being or there not being a unicorn, there are those involving what are called propositional attitudes: believing, doubting, maintaining, etc., and these will briefly be considered in the last section of this chapter.

(31) Jane is looking for a unicorn.

If a representatum is neither true nor false, either because it has failed to satisfy the conditions of Delta or Gamma or because no attempted match has been made, then I shall say that it is undetermined. It is not, therefore, the case that all representata are held either true or false: the form of the law of excluded middle which runs, "If r is a representatum, then either r is held true or r is held false" does not hold in the model of the semantic apparatus being presented here.

4.2 Truth, Falsity and Negation

So far, only positive representata have been considered. Now we must turn to how it is that negative representata, i.e. those containing negative elements, are held true or false. I have already remarked that the almost universal practice of bringing arguments concerning presupposition to bear on the question of negation and arguments concerning negation to bear on the question of presupposition seems unwise, to say the least, given that neither of these notions are clear-cut and both involve very considerable difficulty. Because of this, I attempted in the previous section to deal with what I consider to be the real problem of presupposition, viz. that concerning the falsity of a positive representatum. The conclusion reached in the previous section was that Strawsonian type presupposition plays no part in truth values. Consideration of examples containing negatives is often held to show that this conclusion must be wrong. I shall argue, however, that such considerations rest on a misunderstanding of the function of negatives and of a confusion over what is negated in various negative sentences. I shall begin with what I think is the correct explanation of negation and then I shall consider some of the discussion and examples on this topic from the most recent literature.

Traditionally, and by far the most commonly held view to

this day¹⁹, is that the most basic operation of a negative is to negate a whole proposition. Morphologically incorporated negatives, such as in unrivalled, inconspicuous, disproportionate, are recognised to be sure, but they are not thought to herald the possibility that particular item negation is more widespread than the formal manifestation indicates. But if the idea of whole proposition negation is to be taken seriously, then something like the Russell analysis of names and definite description, illustrated in 4.1 (18), (19), above is needed, because it is widely recognised that different parts of a sentence may be negated. If all negation is propositional then a sentence must decompose into various propositions in order that the various parts may appear in propositions and thus be capable of negation. Traditionally, two types or two scopes of negation are recognised: Unmarked, internal, or narrow scope negation; Marked, external, or wide scope negation. So in (1) the negation is internal or has narrow scope, being restricted to the predicate; whereas, in (2) the negation is external or has wide scope, negating the whole sentence (or, rather, the utterance of that sentence).

(1) The king of France NOT (is bald).

(2) NOT (The king of France is bald).

¹⁹ A notable exception is Gabbay and Moravcsik (1978) who allow negation of constituents; however, even here, sentence negation is taken as the more basic or ordinary according to Seuren(1985).

But why stop here with just two²⁰ positions for the negative? Language abounds with examples where the sense is that negation clearly occurs other than in these positions. For example, by use of stress and a change of intonation it can be made plain to a hearer that it is the capitalised words in (3) and (4) which are being denied and not any other parts of the utterances.

(3) The KING of France is not bald.

(4) The king of FRANCE is not bald.

A Russellian type analysis could, I believe, capture these different positions of negation but only by multiplying the number of propositional functions into which the definite description decomposes. Hence instead of the proposition in (5), one could have the set of proposition, (6) - (9).

(5) x is the king of France now.

(6) x is a king, z , at a time, t_1 .

²⁰ Seuren (1985 : 216) raises a similar point for Russell's propositional analysis, but whilst it is true that Russell concentrates on two ways of "The present king of France is bald" being false, viz. the present king of France not being bald and the present king of France not existing, it does seem to me that further propositions could be posited in the Russell style which would readily accommodate other positions for the negative.

(7) z is the king of France at a time, t_2 .

(8) $t_1 = \text{"now"}$.

(9) $t_2 = \text{"now"}$

The uniqueness condition still needs to be added to this set of propositions, but it can be readily seen how utterances of (3) and (4) could be true, without denying that which is true, by using a finer decomposition into propositional functions. However, although I think that suitably fine decomposition into propositional functions may paraphrase what is actually happening, I do not believe that it offers any explanation of what is going on and I shall not, therefore, pursue it. I shall from now on take it as one criterion of adequacy of a theory of negation that it allows in some way for the denial of almost any item in an utterance and not just for the predicate or the whole utterance.

The view of negation taken here is that there is only one negator, but that this negator is frequently ambiguous when realised in language with respect to scope. Internal or unmarked and external or marked negation do not signal different types of negator, merely a different scope of the same negator. I assume that the scope possibilities of what I shall call scopal negation are many and that the morphologically incorporated negatives are also instances of scopal negation with very narrow scope.

The mechanics of the scopal negator within the model of

the semantic apparatus are quite readily envisioned. The scopal negator acts in the same way as bracketing does in written language to demarcate the extent of the effect of the negative. This bracketing effect of the scopal negator may be viewed as being achieved by the scopal negator having two associative links (in the case of only one negative) with the representatum to mark the end points of its influence. Hence in Figure 4.2.0, only BLONDE lies within the scope of the negator.

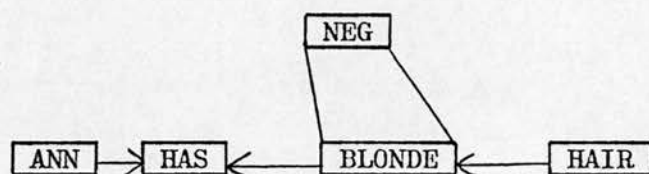


Figure 4.2.0

In actual operation, I take it that the scopal negator acts like a kind of label, which when associated with a representatum or part of a representatum has the effect of designating that representatum or that part of the representatum as not in fact representing at all. In other words, whilst a positive representatum purports to represent, a negative representatum purports not to represent, and in some cases will indicate by the scope of the negator precisely what part of the representatum supposedly does not represent.

In considering whether a negative representatum matches,

that part or those parts outside the scope of the negator must match in the usual way, whereas the part within the scope of the negator must not match. Hence in the case of (10), one reading is that a situation does not obtain now where Jane smokes. If Jane does in fact smoke now, then (10) is false because that part of the representatum corresponding to (10) which was labelled as not representing by the negator, does indeed represent.

(10) Jane does not smoke.

An example such as (11) could²¹ be many ways ambiguous in respect of the negative. The various possibilities are shown in (12) where brackets indicate the scope of negation.

(11) Ann hasn't blonde hair.

(12)(a) Ann has blonde NOT (hair)

(b) Ann has NOT (blonde) hair

(c) Ann NOT (has) blonde hair

(d) NOT (Ann) has blonde hair

(e) Ann has NOT (blonde hair)

²¹ The emphasis here is on the could. In many situations, because of stress, intonation, previous linguistic context, general context, or particular knowledge, an utterance of (11) would not in any way be taken as ambiguous. But since it could in general have various readings, account must be taken of how this is possible.

- (f) Ann NOT (has blonde hair)
- (g) NOT (Ann has blonde hair)
- (h) NOT (Ann has) blonde hair
- (i) NOT (Ann has blonde) hair
- (j) Ann NOT (has blonde) hair

For simplicity of exposition, let it be assumed that (12a) to (12g) are representata, then attention can be concentrated on the conditions that must obtain for these representata to match. The scope of the negator in (12a) is restricted to HAIR and for (12a) to match, its contents, excepting HAIR, must be contained in a stimulum. Notice that in (12a) that there be Ann is not presupposed but is entailed because ANN lies outside of the scope of the negative and must, therefore, be contained in a stimulum. Examples (12b) - (12d) are similar to (12a) in that the scope of the negative is restricted to a single item, but in the case of (12d) there is a requirement that ANN not be matched and, by implication, there not be a relevant Ann.

Examples (12e) - (12g) differ from those of (12a) - (12d) in having more than one item within the scope of the negator. The requirement for a match in these cases is precisely the same as in the former cases but because more than one item is within the scope of the negator, the consequences are somewhat different. It will be remembered that a representatum fails to match if its contents are not contained in a stimulum.

A part of a representatum fails to match if its contents in the context of the rest of the representatum are not contained in a stimulum. The upshot of this is that only one item within the scope of the negator needs to fail to match in order for everything within the scope of the negator to fail to match. Hence in the case of (12e) it is sufficient that Ann has dark hair for there to be a match since that part of it within the scope of the negator, viz, BLONDE HAIR, will fail to match since BLONDE fails to match. There is no requirement in such a case that Ann be hairless too. Thus in example (12g) it is not necessarily the case that the entailment concerning Ann is cancelled. (12g) will match both if there is no Ann and if there is an Ann but she doesn't have blonde hair. The only sure way to cancel the entailment of Ann's existence is by using (12d).

The various possibilities of scope with the scopal negator and the fact that a failure to match may be induced by one or more elements within the scope of the negator leads to situations where there can be a vagueness about the meaning of some negative utterances. The term vagueness I appropriate from Kempson (1975) where she draws a distinction between vagueness and ambiguity. Although Kempson makes this distinction, she does not make it quite as precise as would be useful. This is so, I think, because she continues to talk of sentences as being both vague and ambiguous. She has this to say on page 16:

Furthermore, the two semantic concepts of vagueness and ambiguity are theoretically distinguished. An ambiguous sentence is formulated as having two quite separate structures, whereas a vague sentence is one which is characterised semantically by a disjunction.

Kempson, in speaking of sentences as being both vague and ambiguous, blurs the sharp distinction between ambiguity and vagueness. Only something which has meanings can be ambiguous. Therefore a sentence, sign, or sub can be ambiguous because they can all have more than one meaning. Meanings themselves, however, cannot be ambiguous since meanings do not have meaning but ARE meanings. Vagueness, in contrast, is not a property of sentences, signs, or subs at all, but a property rather of meanings. Speaking loosely for convenience one might talk of an utterance as being vague instead of ambiguous to mean that the utterance is not ambiguous but its meaning is vague, but such loose talk is likely to hide the fact that vagueness is a property of a meaning that an utterance might have and not a property of the utterance itself. An utterance which has a vague meaning is not itself vague: it is quite precise in designating a vague meaning.

Negative representata are therefore matched in the following way:

(13) Negative Representata Match

A negative representatum matches if all parts of it not within the scope of the negator match and each scopal

segment of it fails to match. Where scopal segment is defined as that part or whole of a representatum which lies within the scope of the negator and is the greatest such part that lies within that particular scope of the negator.

Scopal segment is so defined in (13) as not to require that every part of a representatum which is within the scope of the negator fail to match because if it was, then there would be no vagueness in respect of negation and this is contrary to the data.

The conditions specified in 4.1 (17) and (29) for holding a representatum true and false respectively now apply to negative representata as well as positive representata. Again, attention is restricted to basic representata, i.e. representata which do not involve any inferences beyond the reduction inference to be held true/false.

Before leaving the proposals on negation and considering how they fare in comparison to some other recent treatments, a comment is called for concerning double negation. In some English dialects, double negatives cancel each other out, but there are many dialects and languages where this cancellation does not happen; rather there appears to be a reinforcement effect. In some cases, Spanish for example, the use of multiple negatives is obligatory and any reinforcing effect is perhaps long lost. A study of the limits of the cancellation and reinforcement effect might be quite informative as to

how negation works in language. For example, it is readily agreed that there is no question of the negatives in the first or second conjunct of (14) cancelling or reinforcing the other. The cancellation and reinforcement effect do not seem to cross conjunction boundaries.

(14) Jill didn't meet Jane and Ann didn't go to town.

In traditional terms, cancellation and reinforcement are restricted to operating within a clause, whether that clause is co-ordinate as in (14) or main or subordinate as in (15).

(15) Ann didn't see the man that Jane didn't know.

It seems to be a reasonable assumption that negation cancellation and reinforcement effects occur when two scopes of the negator overlap, and the fact that such effects are in general clause limited suggests that a scope of the negator rarely exceeds that of the clause. It would be interesting to find within the model of the semantic apparatus a reason as to why this should be so, especially in view of the considerable flexibility of scope that the negator is supposed to have in that model. I have not, however, been able to discover any plausible reason for the clause limited scope of negation and the matter remains a puzzle.

That negator scope interaction within the clause is responsible

for cancellation and reinforcement effects is supported by the lack of such effects when one of the negator scopes is indicated by morphologically incorporated negatives as in examples (16) - (20).

- (16) She cannot avoid the unavoidable.
- (17) Impatience is not a virtue.
- (18) I never visited the non-Africans.
- (19) Jane did not sense the inhospitality.
- (20) People do not see the inconspicuous.

In such cases, the morphologically incorporated negative indicates narrow scope, scope restricted to a single item, and the two scopes of negation do not overlap; hence no cancellation or reinforcement effects.

The lack of negative scope interaction is the case for most morphologically incorporated negatives, but there are exceptions. Chief among these exceptions are the lexical items: nobody, none, nowhere, nothing, as examples (21) - (24) show.

- (21) Jill didn't see nobody.
- (22) Jane hadn't got none.
- (23) Ann hadn't been nowhere.
- (24) She didn't see nothing.

It is undoubtedly significant that in these cases the morphologically

incorporated negative is no-, but I can suggest very little concerning the precise nature of this significance beyond observing that either no- induces wide scope or it is attracted into the other scope of the negator.

The fact that no ready explications are to hand in respect of the clause limited scope of negation or of the negative scope inducing properties of no- does not detract from a scopal view of negation since these remain tough problems for any theory of negation.

I want now to turn to a recent article on negation by Horn (1985). Horn distinguishes two types of negation which he calls descriptive negation and metalinguistic negation. Descriptive negation is very like (the very same as?) internal negation. On the other hand, whilst Horn sometimes uses external negation or marked negation for metalinguistic negation, he uses the latter term to cover such a variety of phenomena that it would be unwise and misleading to construe metalinguistic negation in terms of the more traditional and restricted notions of external or marked negation. For Horn, metalinguistic negation is "...a way for speakers to announce their unwillingness to assert something in a given way, or to accept another's assertion of it in that way." (: 135). Whilst I accept that all of Horn's examples do share this characteristic, I do not believe that this is a useful way to group them given their disparate natures in other respects. I shall look at some of Horn's examples and offer some alternative

explanations of what is going on.

A striking feature of many of Horn's examples is a particular use of stress or intonation. Thus in (25) and (26) the capitalised words are to indicate heavy stress.

(25) SOME men aren't chauvinists - ALL men are. (: 132)

(26) John didn't manage to solve SOME of the problems - he managed to solve ALL of them (: 132)

According to Horn, (25) and (26) exhibit²² metalinguistic negation. In both cases the use of some is being objected to because it understates the situation. Here the prosodic cues tell one that negation is not being used in a normal way but rather to mean something like "not only". However, Horn objects to this explanation on the grounds that it is not extendable to other types of cases. He cites Lehrer and Lehrer (1982) who put forward this interpretation because of the hyponymic relationship involved in such cases. They quote example (27) (their example (14)) in this connection.

(27) This wine is not good, it's excellent.

(28) This wine is not only good, it's excellent.

²² Not typical metalinguistic negation because Horn brings such a variety of phenomena under this label that one would be hard pressed to say what is a typical example.

(27) is to be interpreted as (28) because "excellent" is a hyponym of "good". A similar kind of hyponym - superordinate relationship can be seen as existing between "all" and "some". Horn's objection that this explanation does not extend to other cases surely misses the point: the negative used in this particular type of context containing stress and hyponymy has the meaning of "not only", it does not have the same meaning in other cases because the context is different. It is only Horn's seeking to bring such a disparate set of examples under one term that leads him to claim the inadequacy of the Lehrers' explanation for these particular cases. They might just as well respond that he is seeking to unify that which is not unifiable.

Another use of negation that Horn seeks to bring under the metalinguistic umbrella is exemplified in (29) and (30).

(29) I didn't manage to trap two MONGEES - I managed to trap two MONGOOSES. (: 132)

(30) We didn't { 'have intercourse'/'make love' } - we fucked. (: 133)

In both these cases, prosodic features are used to indicate that negation is not being used in the normal way. In (29) this is achieved by stress and the effect is to give a meaning as paraphrased in (31).

- (31) I didn't manage to trap two things called mongeese -
I managed to trap two things called mongooses.

(31) is not ad hoc as may be learnt by asking any English speaker what (29) means. Frequently, more elaborate paraphrases will be given involving an intimation that mongeese is not the plural of mongoose, but even speakers who do not know this can get the meaning of (31) out of an utterance of (29).

In the case of (30), Horn claims that the negation is being used to deny the style or register of the quoted elements. This seems exactly right, but it is prosodic features (slight pauses and change of intonation pattern) which change quite clearly and precisely the meaning of (32) into something like that of (33).

- (32) We didn't have intercourse - we fucked.
(33) The phrase have intercourse is not appropriate
in this situation where fucked is appropriate.

Notice that in both the paraphrases of (31) and (33) negation remains - presumably descriptive negation in Horn's dichotomy - and this suggests that in this type of metalinguistic negation, the negation can be rendered in non-metalinguistic terms. This raises suspicions as to whether there really is a metalinguistic negator in these cases or whether prosodic

features plus perhaps some inferences simply put the negator in its right setting. Horn himself talks sometimes of the "...metalinguistic uses of negation..." (: 145) rather than of metalinguistic negation, as if after all there is only one negator.

Cases where inference alone, without the help of prosodic features, is used to arrive at the correct meaning are also cited by Horn, although he has nothing to say as to how the correct meaning is arrived at. One such example is given in (34) where a guess that the speaker is talking about Elizabeth II of England and some inferences concerning the fact that although a familiar form of the name Elizabeth is Lizzy in that particular situation it is inappropriate.

- (34) She isn't Lizzy, if you please - she's Her Imperial Majesty. (133)

In dealing with what Horn calls scalar cases on page 139, he gives the examples (35) - (37), remarking

It seems peculiar at first glance that the same state of affairs can be alternatively described in terms of Max's HAVING three children and of his NOT having three children.

- (35) Max has three children - indeed, he has four.
 (36) Max doesn't have three children - (*but) he has four.
 (37) Max doesn't have three children, (but) he has two.

Horn claims that (35) and (36) are consistent, and so they are, but the parts before the dashes are not and for Horn to claim that Max's having three children and Max's not having three children describes the same state of affairs seems very misleading to say the least. The assumption is, of course, that if Max has four children then he has at least three children, just as it is the case that if a box of apples weighs twenty pounds then it weighs at least five pounds; but in both cases the phrase at least is important because it is false that Max has three children and that the box of apples weighs five pounds.

It is perhaps futile to swop intuitions²³ on these matters, but based on his intuitions Horn claims that (36) is a use of metalinguistic negation to deny the conversational implicatum that is carried by the non-negated sentence, viz. that Max has ONLY three children. Once one allows that three is not equal to four, then (36) is perfectly adequately understood with descriptive negation.

Horn observes that morphologically incorporated negatives cannot be metalinguistic. Two of his examples are given in (38) and (39).

²³ Intuitions do vary widely on these types of cases, including my own. Much seems to depend on the subject matter. So, for example, if one asks somebody who has £25 on them if they have £8 the answer will be invariably, "Yes". If on the other hand, one asks a two legged person whether they have one leg, the answer is invariably, "No".

(38) The king of France is $\left\{ \begin{array}{l} \text{not happy} \\ \text{/*unhappy} \end{array} \right\}$ - there isn't any king of France.

(39) The queen of England is $\left\{ \begin{array}{l} \text{not happy} \\ \text{/*unhappy} \end{array} \right\}$ - she's ecstatic.

In both these cases, the morphologically incorporated negative in unhappy will not permit what Horn calls a metalinguistic use, but what might be more generally seen as a wide scope reading. This, of course, is hardly surprising if the variable scope of negation is accepted since apart from the exceptions noted earlier, morphologically incorporated negatives have their scope firmly restricted to the item in which they occur. So in the case of (38), the scope of the negative in unhappy is restricted to happy and cannot be widened or moved to cover the king of France. The scope of not is not so restricted. In the case of (39), there is no possibility of reinterpreting the incorporated negative as "not only", but as was seen earlier in (27) this is perfectly possible with not in the case of a hyponymic relation.

Horn has collected together under the umbrella term of metalinguistic negation a disparate bunch of uses of negation. Clearly, the negatives that occur in language are sometimes ambiguous with respect to scope and clearly where prosodic features or inference indicate that the normal meaning of an utterance involving a negative does not hold, then a revision

of meaning, including very often a movement of the negative, occurs; but these things by themselves do not justify the descriptive/metalinguistic dichotomy suggested by Horn. In particular, Horn's dichotomy offers no suggestions as to why descriptive and metalinguistic negation often do the same job. (40) and (41) have the same meaning, though in (40) one has, in Horn's terminology, descriptive negation, and in (41) one has metalinguistic negation. Prosodic information in (41) restricts the scope of negation just as surely as morphological considerations in (40), and this argues against Horn's distinguishing two types of negation in this case.

(40) That's a young unhappy girl.

(41) That's not a young HAPPY girl.

Another recent treatment of negation has been offered by Seuren (1985). After considering some evidence, he comes to this conclusion:

The minimal conclusion from all this is that there are at least two ways of using the negative operator in language: a presupposition-preserving way and a presupposition-cancelling way. The question now is: what is the optimal formal account of this difference: two truth-functionally distinct negation operators, two possible structural positions of the same negative operator, or some third alternative. (: 234)

Seuren plumps for the first alternative and introduces the terms minimally false for presupposition-preserving negation, and radically false for presupposition-cancelling negation. This gives Seuren a trivalent truth-value system instead of the classical bivalent one.

Seuren makes a point of emphasising (: 240) that radical negation cannot be equated with metalinguistic negation since frequently it will be minimal negation which is involved in the metalinguistic function. Seuren offers as an example (42).

(42) He isn't just "well off": he is damned rich.

Minimal negation and not radical negation is said to be involved in (42) because all presuppositions are preserved, but clearly the negation is used metalinguistically according to Horn's criterion.

The main evidence that Seuren looks at for his conclusion consists in a number of environments where it is claimed "...negations are per se presupposition-preserving". (: 229). I shall consider these environments in turn to see whether they offer any counter-evidence to the scopal interpretation of negation being proposed here.

(A) Morphologically incorporated negations²⁴ (: 230)

²⁴ I use Seuren's headings, but not his example numbers.

Except for the cases of nobody and never, morphologically incorporated negatives seem to be of the minimal negation type only. Hence, both (43a) and (43b) entail that Harry exists, whereas (44) does not. If the morphologically incorporated negative is used to try and cancel the presupposition of Harry's existence as in (45) then a contradiction results.

$$\left. \begin{array}{l} (43)(a) \text{ Harry is co-operative} \\ (b) \text{ Harry is unco-operative} \end{array} \right\} = \text{Harry exists.}$$

(44) Harry is NOT co-operative: he doesn't exist!

(45) Harry is UNco-operative: he doesn't exist!

As was noted above, the scope of the morphologically incorporated negative is restricted. It cannot, as Seuren shows in (45), extend to cover other items. The fact that morphologically incorporated negatives (apart from the mentioned exceptions) do not cancel presuppositions follows from their restricted scope and not from any intrinsic feature they possess.

(B) Negation in non-canonical positions (: 230)

By canonical position for negatives in English, Seuren means that the negative is in construction with the finite verb. According to Seuren all non-canonical negations are minimal in that they are presupposition preserving. Hence (46) entails that there were doors, and (47) is a

contradiction because it attempts to cancel this entailment. There is no contradiction in (48) where the negative is in canonical position.

(46) Not all the doors were shut. = There were doors.

(47) NOT all the doors were shut: there WERE no doors.

(48) Tim did NOT shut all the doors: there WERE no doors.

Again this evidence is consistent with a scopal analysis of negation. The change of scope possibilities indicated by position is only to be expected if scope possibilities are to serve any useful purpose.

(C) Non-extraposed factive subject clauses (: 230)

Certain verbs, called factive verbs in the literature, are said to presuppose their complement sentences. Hence if I realise that I have missed the bus, then I have indeed missed the bus and if I do not realise that I have missed the bus, then I have still missed the bus. What Seuren notices in examples like (49), (50), and (51) is that with some factive verbs negation in canonical position with the factive verb does not usually cancel the presupposition of the factive clause when it is in subject position. Thus (49) is said to presuppose that Bill was guilty, and this leads to a contradiction in (50) when this is denied. In (51) there is no such contradiction because the clause is now a complement and no longer a subject.

- (49) That Bill was guilty did not surprise her. = Bill was guilty.
- (50) That Bill was guilty did NOT surprise her: he WASN'T guilty.
- (51) It did NOT surprise her that Bill was guilty: he WASN'T guilty.

Hence in (49) and (50) one has presupposition-preserving minimal negation and in (51) presupposition-cancelling radical negation. This is a useful observation, but it is not explanatory. A scopal analysis of negation on the other hand, offers an explanation as to how (but not as to why) these distinctions are made. To see this it is necessary to cash the usually used above. Seuren makes this parenthetical remark with regard to (50):

Note that (13c) [50] is not contradictory with contrastive accent on the subject clause and parenthesis intonation on he wasn't guilty. It is, however, clearly contradictory with accents on not and wasn't as in (13c). (: 231)

Thus Seuren recognises that there are ways of cancelling the presupposition of the factive clause even when in subject position. But this merely goes to show that intonation and emphasis are important cues for establishing the scope of negation, and not that there are two types of negation. Revising (50) as suggested by Seuren in the above quotation, one

has (52), which is no longer a contradiction.

- (52) THAT BILL WAS GUILTY did not surprise her: (he
wasn't guilty).

The scope of negation in (50) and (52) is now shown in (53) and (54) respectively.

- (53) That Bill was guilty did NOT (surprise) her: he
was NOT (guilty).

- (54) That Bill NOT (was guilty did surprise) her: he was
NOT (guilty).

Of course, (54) represents a vague meaning since the scope of the first negative is so wide; but the alternative is to treat (52) as ambiguous, which indeed it may be. She might have been surprised but not by Bill's guilt, and certainly, if the last clause is true, she could not have been surprised by his guilt. Bill and her are outside the scope of negation in (54) and this means that if (54) is to be true then "Bill" and "her" must match. This amounts to saying that (54) entails that there be a Bill and a she, and does not merely presuppose them. One difficulty with Seuren's whole approach on this matter is that whilst radical negation is said to cancel presuppositions, it is not clear what ones it cancels. Seuren certainly seems to envisage a reading of (52) where the presupposition concerning

Bill is taken to hold, but even this could be cancelled in the case where the last clause is replaced by: "There's NO such person".

(D) Cleft and pseudocleft constructions (: 231)

(55) is a contradiction because the pseudocleft sentence entails that he said something even though it may not have been "aargh".

(55) What he said was NOT "aargh!": he didn't say anything at all!

This in fact may be a similar situation to that seen in (C) above, for in both cases one has a first clause which does not usually come within the scope of a following negative. Once the negative is moved into the first clause then the cancellation of any entailment seems to be possible:

(56) What John did NOT say was "aargh": he said nothing!

(57) What JOHN did not say was "aargh": there is no John!

Notice that with a preceding negative as in (58) and subordination, cancellation of entailments is straightforward.

(58) It is not the case that what John said is "aargh":
nothing at all was said.

(E) Contrastive accents (: 231)

Seuren observes that (59) and (60) entail that somebody

started the argument and that a contradiction results, as in (61), if one attempts to cancel this entailment.

- | | | | |
|---|--------------------------------------|---|-------------------------------------|
| (59) | The WAITER STARTED THE ARGUMENT | } | = somebody started
the argument. |
| (60) | The WAITER didn't start the argument | | |
| (61) The WAITER did NOT start the argument: NOBODY did! | | | |

This is excellent evidence for a scopal analysis of negation since the item bearing the contrasting accent restricts the scope of negation to itself and in the context of (61) this cannot be overridden by stress on the negative. Seuren, however, claims that (62) is not contradictory. My intuitions are that it is because the scope of the negative is again restricted to "waiter" by stress or contrasting accent. For me it is (63) rather than (62) which is non-contradictory.

- (62) It is not true that the WAITER started the argument:
nobody did!
- (63) It is NOT true that the waiter started the argument:
nobody did!

(F) Negations in non-assertive clauses (: 231)

Clauses involving verbs such as seem, appear, look (= "have the appearance of") do not assert that something is the case. In such cases, Seuren notes that presuppositions are not cancelled. Hence (64) entails that Harry had a sister

and this leads to a contradiction in (65) where an attempt is made to cancel the entailment. In (66), on the other hand, the first clause does not entail that Harry has a sister, and so (66) does not involve a contradiction.

(64) Harry seems NOT to have been to his sister's funeral.

(65) Harry seems NOT to have been to his sister's funeral:
he never HAD a sister!

(66) Harry has NOT been to his sister's funeral: he never
HAD a sister!

Why the scope of the negative in (64) and (65) should be restricted to the verb cluster when it is not similarly restricted in (66) is something of a mystery. Clearly it has much to do with the particular verbal item and verbs like seem might have a clearly defined range for what it is that is only seeming as opposed to what is accepted. Whatever the correct answer, these examples offer no evidence against a scopal analysis of negation.

(G) Negations with Negative Polarity Items (: 232 ff)

Negative polarity items (NPIs) are words or phrases which require an accompanying negative, negative adverb or adjective, in declarative sentences: such sentences becoming ungrammatical if the negative is omitted. Hence, in English one can say: "I haven't seen her in weeks", but not: "I have seen her in

weeks". Seuren lists a number²⁵ of NPIs and notes that in some cases emphatic or contrastive accent can replace the negative. He maintains that in the case of factive NPIs these preserve all the presuppositions of their positive counterparts (ignoring the ungrammaticality of those positive counterparts presumably). Hence, because (67) entails that Joe's boss is an alcoholic, (68) is a contradiction

(67) Joe does NOT mind that his boss is an alcoholic.

(68) Joe does NOT mind that his boss is an alcoholic: the man ISN'T an alcoholic!

Since NPIs by definition are closely bound up with negation, it is not really surprising that they should involve some scope restrictions on negatives.

In contrast to NPIs, Seuren discusses positive polarity items (PPIs). These are not strictly opposite to NPIs since it is not the case that they cannot be used with a negative, but when they are they produce what Seuren describes as "...a feeling that the non-negated sentence has been uttered just before, and the negation is felt to have the function of indicating that there is something radically amiss with that

²⁵ Some of these seem doubtful to me. Seuren lists can possibly, for example, but: "I can't possibly make it next week" and "I can possibly make it next week" both seem equally acceptable to me without any need for the emphatic accent which Seuren notes can replace the negative in other cases.

sentence as a whole." (: 233). Seuren gives examples (69) and (70) to highlight the contrast between the way an NPI (any more) under negation preserves presuppositions and the way in which a PPI (still) under negation cancels presuppositions. (69) is, therefore, a contradiction, while (70) is not.

(69) Harold doesn't live in Paris any more: he has never
set foot in France!

(70) Harold does NOT still live in Paris: he has never
set foot in France!

From this evidence, Seuren argues for two negators: a presupposition-preserving negator, the minimal negator; and the presupposition-cancelling negator, the radical negator. The evidence that Seuren adduces, however, is perfectly consistent, as we have seen, with a single, variable scope negator. What is clear from Seuren's evidence is that environment (including especially prosodic features) is important in determining scope. The fact that entailments (or presuppositions, in Seuren's terms) change according as the scope of negation changes, is satisfactorily accounted for by the changing matching requirements that changes in scope bring about; and entailment changes are best viewed as the consequences of scope changes and not as the cause, for in that way no independently motivated account of entailment changes need be sought.

4.3 Other Attitudes

Holding²⁶ something true is a sort of unmarked attitude because this attitude or opinion does not normally need to be expressed explicitly in language. Naturally, to avoid confusion other attitudes have to be made explicit. For this purpose languages contain a set of attitude verbs. In English, some of these are: believe, think, judge, doubt, maintain. The truth conditions of an utterance containing an attitude verb or phrase (other than it is true/false that) differ from the utterance without the attitude verb or phrase. Hence, (1) can be true even though (2) is false, and (2) can be true even though (1) is false. It cannot, however, be the case that Jill holds (2) true but does not hold (1) true. This is a fact about the meaning of believe.

(1) Jill believes (that) Jane smokes.

(2) Jane smokes.

In contrast, it can be the case that Jill holds (1) true without being willing to assert (2): I may believe that Jane smokes but I might not be of sufficient certainty concerning the

²⁶ Holding is used here as previously to distinguish between what is true and what in somebody's opinion is true. Such opinions are normally asserted in statements without any explicit reference to truth. The locution "I hold x true" in containing an explicit attitude is not of the unmarked kind referred to above.

facts about Jane to assert unequivocally that it is true. The representatum corresponding to (2) may be undetermined as far as Jill or I are concerned because of lack of information or even just because of lack of consideration.

Attitude items like holding true, holding false, believe, know, think, have as their referents processes internal to the semantic apparatus. To hold something true or to believe it is just to be in a state where the holding true process or the believing process has been successful. It is important to make clear that these internal referents for attitude items are not the meanings of those items. The meanings of these items are the discriminators which the referents stimulate, and these discriminators may be invoked while being stimulated just like any other discriminators. The meaning of believe therefore is not the fact of believing but, if one likes, the sensor of the fact of believing. A simple diagram may help make this clear.

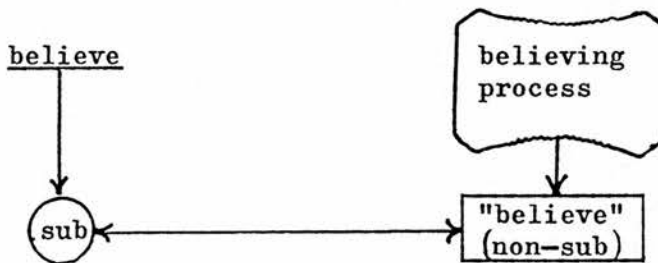


Figure 4.3.0

I shall not attempt to specify here what is involved in the believing process or in the processes relating to the

many other attitude items. This is because it is very unclear as to what is involved in detail. This may be because the meanings of such terms are not homogeneous, i.e. they have more than one underlying process as their referents. That this may be the case is readily seen from the simple mismatch of attitude vocabulary between languages. So, for example, croire in French overlaps but does not coincide with English believe. The way in which the processes connected with attitude items may be spelt out, however, has been fully demonstrated by the cases of holding true and hold false, which themselves are attitudes.

No alteration of the matching requirement is needed for representata containing attitude items since in the case of the attitude holder being the same as the subject of the representatum, if the attitude process has been successful, then there will be a stimulum to this effect; and in the case where the attitude holder is different from the subject of the representatum some inferencing mechanism (beyond the reduction inference) will be involved since, presumably, we can only infer other people's attitudes.

It is possible that attitudes other than holding something true or false may have conditions, like those of Delta and Gamma, which must be satisfied in addition to any other requirements. But if this is the case then there is a possibility of an infinite regress, for suppose it is a condition in Delta that the experience (the stimulum)

be believed veridical, then further suppose that a belief also has conditions and one of these conditions involves a belief, then there will be an infinite regress since a belief depends on a belief and that belief in turn depends on another belief and so on ad infinitum. The only way out of this regress as far as I can see is to assume that there must be basic attitudes which do not have conditions involving other attitudes attached. The possibility of the existence of such basic attitudes is of considerable interest because it involves the idea of some kind of decision procedure which operates in the absence of firm criteria.

5. Sense Relations

In this chapter, I consider sense relations from the point of view of the semantic apparatus. I treat sense relations as objective phenomena (i.e. not a consequence of the theory) which are in need of explanation, and the object here is to suggest some explanations of the major sense relations in terms, as far as possible, of the components of the model of the semantic apparatus already introduced. When this is not possible, new components must be added. My purpose is to attempt to explain the basis of sense relations rather than merely describe them. As such, I reject the purely descriptive approach to sense relations advocated by Lyons:

I consider that the theory of meaning will be more solidly based if the meaning of a given linguistic unit is defined to be the set of (paradigmatic) relations that the unit in question contracts with other units of the language (in the context or contexts in which it occurs), without any attempt being made to set up 'contents' for these units. (1963 : 59)

Despite their name, sense relations do not form a homogeneous class of relationships because some of them hold between form and meaning and others between meanings alone. In

the case of polysemy there is one form and several meanings which may or may not be related. Whereas in the case of hyponymy a relationship exists between one meaning¹ and another, whether or not those meanings are associated with forms. One can bring all sense relations into one class providing one always talks of the meaning of a form, but this way of looking at matters has two serious shortcomings: First, it ignores the fact that a division can be made between sense relations which necessarily involve form and those that do not. Second, it assumes that all meanings are associated with forms; this is especially doubtful with regard to partial synonymy and hyponymy as will be shown later.

One writer who makes a very clear distinction between the two kinds of sense relation is Leech (1974), and he puts it this way on pages 101 and 102:

- (I) Synonymy and polysemy are relations between form and meaning:
 - (a) Synonymy: more than one form having the same meaning.
 - (b) Polysemy: the same form having more than one meaning.

¹ Meaning here is not being used in the strict way defined in chapter 2, but in the usual pre-theoretic way. This is because for something to be a meaning in my terms it must be a non-sub associated with a sub. Meanings that lack an associated form would seem to lack an associated sub. The definitions of hyponymy and partial synonymy to be given later will not mention the word meaning and will, therefore, observe the strict theoretical sense of meaning given in chapter 2.

(II) Hyponymy and incompatibility are relations between two meanings:

(a) Hyponymy is the inclusion of one meaning within another.

(b) Incompatibility is the exclusion of one meaning from another.

I shall follow Leech in his general division of sense relations, but I shall treat partial synonymy as being a relationship between non-subs, and incompatibility will not be taken as unrestricted meaning exclusion.

I take the view that sense relations arise in the first instance within individual associators and that only in a derivative sense can one speak of them occurring in a public semantic system. For this reason, the basic discussion and specification of sense relations is in terms of the individual associator. This is then followed by specification of sense relations in terms of a public semantic system.

Inevitably, there will be rather a lot of definition or specification in this chapter. Such detail is unavoidable if it is to be demonstrated how the fundamentally important sense relations can be handled and explained in the model of the semantic apparatus which has been presented. Some extension of this model will be required but that extension will be modest.

5.0 Polysemy

Polysemy, one form having more than one meaning, is often contrasted with homonymy, two or more identical forms having different meanings. However, from the point of view of the semantic apparatus, this distinction is a logical nonsense, for how can two identical forms be different for an associator? The logical nonsense arises because of the claim that homonymy involves two identical forms. One way round this is to talk of lexemes in the sense of Matthews 1972, 1974, where lexeme is taken to be an abstract unit similar to a phoneme or morpheme. Hence, one would have a lexeme EAR_1 (of hearing) and a lexeme EAR_2 (of corn) and one could say of these that their forms of realisation were homonymous. However, has much been gained by the introduction of the term lexeme? That the term lexeme is useful in technical discussion to identify one sense of the polysemous term word is clear. What is less clear is that its use or the notion it captures is in any sense explanatory. The problem, as is so often the case with abstract terms, is that in order to be useful lexemes must be individuated. There appear to be only two² ways of doing this and only the second way will in fact yield the level of individuation required. The first way of individuating lexemes is by their syntactic function³,

² Cf. Matthews 1974 : 22

³ In the view taken here, of course, syntactic function derives from the meaning of the word form. Cf. chapter 3.

the form class of which their forms are members. Hence, $PLAY_1$ and $PLAY_2$ can be distinguished as lexemes because the forms of $PLAY_1$ are verbs and those of $PLAY_2$ nouns. But this helps not at all in the case of the lexemes EAR_1 and EAR_2 , the forms of which are both nouns. Worse still, syntactic function does not distinguish the lexemes $PLAY_1$ and $WALK_1$ (to walk), since the forms of both are verbs⁴. The second way in which lexemes may be individuated and the only satisfactory way is by their meaning. So $PLAY_1$ and $WALK_1$ are different lexemes because they have different meanings. But this amounts to saying that lexemes are meanings which have lexical forms associated with them. Viewed as such lexeme may be a useful technical term but it is not explanatory; indeed, it may even be misleading since it may obscure the true nature of what is being referred to by its use. The more explanatory way of describing homonymy is, therefore, to say that it is where more than one meaning is associated with but a single form. Such a description of homonymy helps not at all, of course, to distinguish it from polysemy since it is merely a variant of the definition of polysemy.

⁴ The forms of $PLAY_1$ and $WALK_1$ cannot be used to individuate the different lexemes for as Lyons states: "Lexemes as such, as we have seen, are abstract entities and do not have a form" (1977:22). Neither will it do to claim that lexemes are individuated by the formal differences between their associated word-form sets, because two lexemes could have identical, associated word-form sets and the non-occurrence of such identities in any particular language would be merely accidental.

Lyons (1977 : 550ff) suggests two ways in which the distinction between polysemy and homonymy have been drawn. The first concerns an etymological criterion as to whether the words concerned are derived from formally distinct words (homonymy) or distinct meanings have been associated with a single word (polysemy). As Lyons points out (: 551) this criterion has little to recommend it as far as the synchronic study of language is concerned because most speakers are totally unaware of etymological considerations. Added to Lyons' point may be the further all important one that even a lexicographer cannot tell homonyms apart save by using their meaning. All roads, it seems, lead to meaning!

The second way in which Lyons suggests that polysemy and homonymy are distinguished is much more promising. Essentially, the idea is that the meanings associated with a homonymous form are unrelated and those with a polysemous form are related. Thus Chambers's Twentieth Century Dictionary (1964 edition) lists eye as being polysemous, meaning not only "eye" but "anything resembling an eye", including things as diverse as a mine entrance, a loop on a hook, and the centre of a cyclone. All these and many more are felt to share characteristics which relate the meanings of the terms that describe them. A difficulty arises, however, as Lyons notes (: 552), in that what meanings are felt by one speaker to be related are not necessarily felt by others to be related. He points out that ear which is treated by most dictionaries as homonymous is regarded by some speakers

as polysemous in that they feel there is a similarity between the external hearing organ and a seed head of corn and, thus, a relationship between these two meanings of ear.

The relatedness of meaning seems to lie at the heart of any plausible distinction between homonymy and polysemy, but in practical terms this does not allow the distinction to be made precise unless something precise can be said about what relatedness of meaning is. Again as Lyons points out (: 553) it may not just be the quantity of similarity between meanings which counts on some relatedness measure, but the quality of similarity. So, for example, sharing the feature of "animateness" or "physical objectness" might count very low on the relatedness scale because of their widespread occurrence. Whereas sharing a feature such as "adult" might count much higher. All this suggests that instead of a sharp division between polysemy and homonymy there is a cline with many in-between cases. I shall not here attempt, therefore, to offer any distinction between these two, but rather I shall regard homonymy as a sub-type of polysemy⁵ which along with other possible sub-types remains to be distinguished within the general type of polysemy.

The specification of polysemy for an individual associator is quite straightforward.

⁵ There is no particular significance in the choice of polysemy as the general type and homonymy as the sub-type: it could just as well be the other way round.

- (1) Polysemy A sub is polysemous if it is directly associated with more than one non-sub.

x and y are directly associated if the associative link between them does not pass through any collect. This condition is necessary since there will be many associations between non-subs and subs, and by some roundabout route a sub could be indirectly associated with a great number of non-subs.

In terms of the public semantic system, public polysemy is specified as follows:

- (2) Public Polysemy A public language object (v. section 3.2), m, is publicly polysemous for two associators, A, B, if m stimulates, directly or indirectly⁶, a sub, x, in A and a sub, y, in B and both x and y are directly associated with more than one non-sub.

This is a fairly liberal specification of public polysemy for, apart from the constraints imposed by m having to be a public language object for A and B, it is not required that A have the same number of senses for m as B, or that the senses they do share

⁶ Stimulation will be described as indirect or direct in order to leave it open as to what other organs or apparatus may mediate it. In general, it would seem to be the case that much of the stimulation which reaches the semantic apparatus as realised in humans has been mediated by various sense organs.

be identical. Various types of public polysemy could be identified, but there seems little to be gained by doing this, especially since much of this specification would overlap with the specification for public synonymy in one sense.

5.1 Synonymy

Whether there are any true (or, as I shall call them below, strict) synonyms in language is perhaps open to doubt. The fact that, apart from considerations of rhyme and metre, true synonyms would be redundant, may be a pressure which tends to depress their occurrence; however, whether they exist or not, it seems logically possible that they could exist and they must, therefore, be taken account of.

Three types of synonymy are considered here: strict synonymy, i.e. true synonyms interchangeable in all contexts without effect on ANY aspect of meaning; synonymy in one sense, i.e. the synonyms are ambiguous and only one or some of their senses coincide; partial synonymy, i.e. any overlap of meaning whatsoever between linguistic items. The use of linguistic items instead of words is required because synonymy extends beyond single words to phrases, clauses, and sentences.

Although natural language is heavily dependent on linear order, it must be remembered that this is not a logical requirement of language. If, therefore, the specifications given are to be quite general, they cannot involve a term which implies a linear ordering of

words. Hence, terms such as sequence and string cannot be used. For brevity and convenience, I shall use the term M group W for a group of words⁷ in a language, ordered or not, which form a meaningful expression under the syntax of that language. The term M group S will then be used to speak of the subs corresponding to an M group W.

The specification for strict synonymy and synonymy in one sense for an individual associator will now fall into three parts: single subs, M group S's, sub and M group S. Since partial synonymy is to be construed wholly in terms of non-subs, the three part division will not apply to it.

(1) Strict synonymy

- (a) Two subs are strictly synonymous if they are each associated with the same non-subs.
- (b) Two M group S's are strictly synonymous if together with the syntax they invoke the same semantic structures.
- (c) A single sub and an M group S are strictly synonymous if together with the syntax they invoke the same semantic structures.

⁷ I use word here in a wide sense to mean any basic unit that a language uses in a similar way to that in which words are used. In particular, word here covers what else where I call public language objects.

Where semantic structure is as defined as follows:

- (2) Semantic Structure A single non-sub or a structure⁸
of non-subs.

There is no requirement in the specification of strict synonymy that synonyms be unambiguous. Ambiguous synonyms, however, have to be ambiguous in precisely the same way if they are to be strictly synonymous. The syntax, of course, determines what semantic structure is built and it is for this reason that syntax is involved once M group S's are considered. The syntax, however, does not operate on the subs, but only on the non-subs invoked by the subs.

Since strict synonymy deals with true synonyms and since these are possibly non-existent in natural language, any examples offered can only be tentative. Tentatively, therefore, I offer examples (3) - (5) as exemplifying the three parts of the specification of strict synonymy.

- | | |
|-------------------------------------|-----------------------|
| (3) <u>Single/unmarried</u> | (Corresponds to (1a)) |
| (4) <u>Not single/not unmarried</u> | (Corresponds to (1b)) |
| (5) <u>Single/not married</u> | (Corresponds to (1c)) |

⁸ A structure of non-subs is built by linking arguments with argument-places. Cf. Chapter 2.

Synonymy in one sense only requires that ambiguous synonyms have at least one sense with regard to which they are synonymous. As with strict synonymy there are three parts to the specification.

6. Synonymy in one sense

- (a) Two subs are synonymous in one sense if both have an associative link with the same non-subs, but at least one of the subs has an associative link with a non-sub that the other sub does not have.
- (b) Two M group S's are synonymous in one sense if both groups together with the syntax can invoke the same semantic structure, but at least one M group S together with the syntax can invoke a semantic structure that the other M group S together with the syntax cannot.
- (c) A single sub and an M group S are synonymous in one sense if together with the syntax they can invoke the same semantic structure, but at least one of them together with the syntax can invoke a semantic structure that the other cannot.

As examples, again tentative, of synonymy in one sense, I offer:

- | | |
|--|-----------------------|
| (7) <u>Page/sheet</u> | (Corresponds to (6a)) |
| (8) <u>Place of worship/house of God</u> | (Corresponds to (6b)) |
| (9) <u>Bachelor/unmarried man</u> | (Corresponds to (6c)) |

Most synonyms will probably only be partially synonymous in that their meanings or one of their meanings coincides to a greater or lesser extent but they are not identical. Partial synonymy is best seen, therefore, in terms of meaning alone. The coincidence of the meanings of what might be called partial synonyms could vary greatly from being almost identical ((a) in Figure 5.1.0) to having very little in common ((d) in Figure 5.1.0).

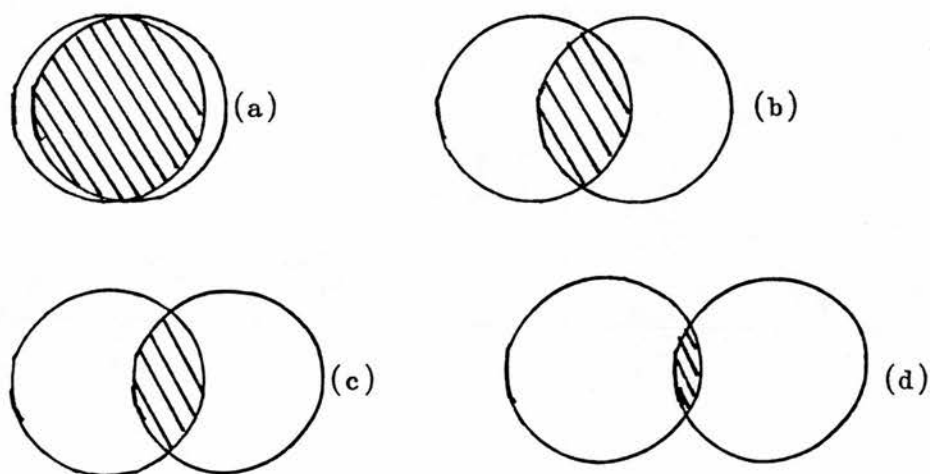


Figure 5.1.0

Because of this variability in coincidence of meanings, it would be possible to subdivide partial synonymy into as many categories as one wished; but, as in the case of polysemy and homonymy discussed above, the criteria of similarity of meaning

are not self-evident. The special case of partial synonymy called hyponymy will be discussed later, but no other attempt will be made to differentiate out other particular types of partial synonymy except to note that under the specification of partial synonymy given in (10), the relationship of the meanings of strict synonyms and synonyms in one sense come out as other special cases of partial synonymy.

- (10) Partial synonymy Two semantic structures are partially synonymous if they contain some or all of the same discriminators.

Turning now to synonymy as a sense relation in a public semantic system, it becomes necessary to give a somewhat involved set of preliminary definitions of sameness of meaning for two (and hence for any number) of associators. I begin by specifying what public simple sameness of meaning requires. It is simple sameness of meaning rather than just sameness of meaning because it involves only what was called in chapter 3 the core subset of a public language. Essentially, items in the core subset of a public language are those for which observable referents exist.

- (11) Public simple sameness of meaning

- (a) A public language object, m , has simple sameness of meaning for two associators, A , B , if m stimulates

directly or indirectly a sub, x , in A and a sub, y , in B and x and y are associated with non-subs in A and B which are stimulated directly or indirectly by the same objects under the same conditions.

- (b) An M group W, M , of a public language has public simple sameness of meaning for two associators, A, B , if M stimulates directly or indirectly an M group S, X , in A and an M group S, Y , in B , and together with the syntax X and Y invoke semantic structures, S_1 , in A and semantic structures, S_2 , in B , and S_1 and S_2 are stimulated directly or indirectly by the same object under the same conditions or by the same arrangement of the same objects under the same conditions.

What it is for an object to be the same object for two associators will be considered shortly.

Having now established what public simple sameness of meaning involves, public sameness of meaning simpliciter can now be specified.

(12) Public sameness of meaning

A public language object, m , or an M group W, M , of a public language has public sameness of meaning for two associators, A, B , if either $m(M)$ has public simple

sameness of meaning for A and B or $m(M)$ is wholly definable in other public language objects which do have public simple sameness of meaning for both A and B.

By definable here is meant no more than that the words in the public language which do not have public simple sameness of meaning for associators because they lack observable referents, be able to be defined, at least in the sense that their use can be described, in words that do have public simple sameness of meaning. This is how a dictionary works: it defines meanings of words in terms of other words, the latter words hopefully being familiar to the dictionary user. The point of insisting on non-core public language objects being definable in terms of the core subset of the language is that this is the only way, given the model and the background assumptions, that it makes any sense to talk of two speakers of the language as having the same meanings for that language.

In order to be able to give a specification for synonymy in one sense in a public semantic system it is necessary first to specify what it is to have public simple sameness of meaning in one sense and public sameness of meaning in one sense.

(13) Public simple sameness of meaning in one sense

- (a) A public language object, m , has public simple sameness of meaning in one sense for two associators, A, B, if m stimulates directly or indirectly a sub, x ,

in A and a sub, y, in B, and x is associated with non-subs, t, u, in A and y is associated with non-subs, v, w, in B, and t and v, but not u and w, are stimulated directly or indirectly by the same objects under the same conditions.

- (b) An M group W, M, of a public language has public simple sameness of meaning in one sense for two associators, A, B, if M stimulates directly or indirectly an M group S, X, in A and an M group S, Y, in B, and together with the syntax X invokes the semantic structures S_1 and S_2 in A and Y invokes the semantic structures S_3 and S_4 in B, and S_1 and S_3 , but not S_2 and S_4 , are stimulated directly or indirectly by the same object under the same conditions or by the same arrangement of the same objects under the same conditions.

Public sameness of meaning in one sense can now be specified in a straightforward way using the definition of public simple sameness of meaning in one sense.

(14) Public sameness of meaning in one sense

A public language object, m, or an M group W, M, of a public language has public sameness of meaning in one sense for two associators, A, B, if either m (M) has

public simple sameness of meaning in one sense for A and B or $m(M)$ is wholly definable with respect to one sense in terms of other public language objects which do have public sameness of meaning for A and B.

Finally, by way of preliminaries, something must be said about what it is for an object to be the same object for two associators because the foregoing definitions rely heavily on this notion.

To begin with, it is important to bear in mind that the whole notion of public language rests on the premiss that there are external objects. Here I am not concerned with the rightness of this premiss, but only with the fact that in talking about public language from the point of view of general semantics, this premiss is accepted without question. This acceptance is not a matter of choice. If there is to be public language, then an explanation of how this is possible, how two associators can be talking about the same things, is required. As far as I can see, the only remotely plausible explanation is that public language is possible because external objects mediate the private worlds of meaning of associators. The starting point, then, for the idea of "same object" is that there are in reality external objects. Furthermore, if there are external objects, then these can occur in various relationships to each other. that is, in various arrangements.

In considering sameness of objects for associators, there

are two cases to be covered. First, there is the question of what constitutes the same object in respect of a single associator. Second, there is the question of what constitutes the same object for two or more associators. The first question is somewhat easier than the second and I shall begin with it.

An account of what it is for an object to be the same object for a single associator will go something like this: An associator, A, receives a set of stimulations from external objects. A groups the stimulated discriminators into one or more collects. The stimulations will, of course, be fixed in time but there could be no sameness⁹ of object if time was a factor, i.e. the same building I see out of my window each day could not be the same building if by being the same was meant that each experience of the building has to share the same point in time. It may thus be assumed that in the case of sameness of objects, time is not a factor. When, in the future, the collects A has formed are stimulated, then A is held to be experiencing the same object or objects as originally experienced. In all probability, stimulation of the collects after their initial formation will be a matter of degree according to how similar the stimulus sources are. Sameness will then be also a matter of degree and may sometimes more happily be called

⁹ What constitutes sameness of object in an objective sense is a much discussed matter and I do not address that problem here. Rather the associator-centred description of sameness avoids this difficulty, I believe, without any loss to the purpose at hand.

similarity.

Although the premiss that there are external objects is to be assumed and not questioned, it is not assumed that these external objects, these causes of stimulations, come in such types and patterns that all associators (strictly realisations of associators) are stimulated by all external objects. Rather it is assumed that different species might have discriminators which are receptive to different stimulations. This possibility, pushed to the extreme, leads to the colouron case of chapter 3. The possibility of different realisations of associators having different receptiveness to the stimuli of external objects is the first problem in talking about sameness of objects for two or more associators.

The second problem is that two associators might receive exactly the same number of stimulations in the presence of a set of external objects, and yet each might associate their stimulated discriminators into different collects. In such a situation, an associator, A, might recognise three objects, while an associator, B, might recognise only two. Again in accepting the premiss that there are external objects, nothing is assumed about their objective number. How many external objects occur in a certain situation may vary from associator to associator.

Both these problems can be overcome by the specification given for sameness of object for two associators in (15).

(15) Sameness of object for two associators

An external object, 0, is the same for two associators, A, B, if it is the case that A has a non-sub, x, and B has a non-sub, y, and BOTH x and y are invariably stimulated in the presence of 0.

Extra details will need to be added to (15) in the case of particular realisations of associators. So, for example, it will be necessary to specify in the case of human associators that they are open to the possibility of stimulation by an object by ensuring that they have their eyes¹⁰ open, that the light is good, that they are not daydreaming, etc. Ensuring that all such details are attended to is important in the case where one wishes to know as far as possible whether an object is the same object for two associators, but it does not change or bear on the general question as to whether an object is in fact the same object for two associators. The distinction is important, for (15) does not set out to specify how one could know that 0 was the same object for A and B, but simply to state what it is for 0 to be the same object for A and B.

Utilising the various preliminary specification given concerning sameness of meaning, it is now possible to state what strict synonymy and synonymy in one sense are in a public

¹⁰ I am not suggesting that humans receive stimulation only through sight. The conditions mentioned are just a sample.

semantic system.

(16) Public strict synonymy

Two public language objects, m , n , or two M group W's, M , N , of a public language or a public language object, m , and an M group W , N , are publicly strictly synonymous for two associators, A , B , if $m(M)$ has public sameness of meaning for A and B and the subs that m and n (M and N , or, m and N) stimulate in A are strictly synonymous and the subs that m and n (M and N , or, m and N) stimulate in B are strictly synonymous.

Essentially, (16) amounts to this: If a word, x , has public sameness of meaning for two associators, and if each of these associators has another word, y , which is strictly synonymous with x for each associator, then x and y are publicly strictly synonymous.

(17) Public synonymy in one sense

Two public language objects, m , n , or two M group W's M , N , of a public language or a public language object, m , and an M group W , N , are publicly synonymous in one sense for two associators, A , B , if $m(M)$ has public sameness of meaning in one sense for A and B , and the subs that m and n (M and N , or, m and N) stimulate in A are synonymous in one sense and the

subs that m and n (M and N , or, m and N) stimulate in B are synonymous in one sense.

In a similar vein, it would be possible to give a specification of what might be called public partial synonymy, but it would have to be expressed in a somewhat circuitous way to allow for the fact that partial synonymy has been defined in terms of non-subs alone.

5.2 Hyponymy

Hyponymy is meaning inclusion. For example, the meaning of woman includes the meaning of female, and the meaning of whale includes both the meaning of mammal and the meaning of animal, whilst the meaning of animal is itself included in the meaning of mammal. Hyponymy is a relation from the more specific meaning, the hyponym, to the more general meaning, the superordinate. Hence, in the foregoing examples "woman" is a hyponym of the superordinate "female" and "whale" is a hyponym of both the superordinates "mammal" and "animal", whilst "mammal" itself is a hyponym of the superordinate "animal".

Hyponymy can be regarded as a unilateral implication with the meaning of the hyponym indicated in the antecedent and that of the superordinate in the consequent. Hence, if x is a woman, then x is female; if x is a whale, then x is both a

mammal and an animal; and if x is a mammal, then x is an animal.

The unilateral implication from hyponym to superordinate is only preserved outside of negation. Thus, whilst (1) entails (2), (3) does not entail (4).

- (1) A woman left here.
- (2) A female left here.
- (3) No woman left here.
- (4) No female left here.

Or, to take an example used in the literature: Lyons (1977 : 292) offers (5)'s implication of (6) as showing the hyponymous relationship of "crimson" and "red", but this implication is cancelled if one introduces a negative as in (7) and (8).

- (5) She was wearing a crimson dress.
- (6) She was wearing a red dress.
- (7) She wasn't wearing a crimson dress.
- (8) She wasn't wearing a red dress.

In the case of the hyponym and superordinate coming within the scope of the negator, as in (7) and (8), the unilateral implication goes in the other direction; from superordinate to hyponym. Hence (8) implies (7).

Negation, however, is not the only factor affecting the implications that hold between hyponyms and superordinates in

particular contexts. (9) does not imply (10), nor (11), (12) despite there being no negative in sight.

- (9) The people in crimson hats were nice.
- (10) The people in red hats were nice.
- (11) Every person in a crimson hat was allowed in.
- (12) Every person in a red hat was allowed in.

Neither is it clear that the implications hold the other way around, for whilst it is the case that if there were people in crimson hats and (10) and (12) were true, then (9) and (11) would be true, (10) and (12) by themselves say nothing about there being people in crimson hats. Example (12) is perhaps open to more debate in this respect in the sense that some might hold (12) to be true in the case where there were no people in red hats; however, (10) cannot, on a normal understanding of English, be given such a conditional reading, and the most that one can deduce from the truth of (10) is (13).

- (13) If there were people in crimson hats then they were nice.

The sense relation which holds between a hyponym and the superordinate is, however, constant and independent of the context sensitive implications that hold between them. Hyponymy in the case of an individual associator is specified in (14).

- (14) Hyponymy A semantic structure, x , is a hyponym of a superordinate semantic structure, y , if all of the discriminators of y together with their significant structure, if any, are also in x , and provided that any discriminators within the scope of the negator in x are also within the scope of the negator in y .

It will be recalled that a semantic structure is either a single non-sub or a structure of non-subs. The requirement concerning the negator is needed to stop, for example, "unconnected" being a hyponym of "connected".

Turning now to the specification of hyponymy in a public semantic system, one has:

(15) Public hyponymy

A meaning, i , of a public language object, m , or an M group W, M , of a public language is a public hyponym of a meaning, j , of a public language object, n , or an M group W, N , of a public language for two associators, A, B , if each of $m(M)$ and $n(N)$ has public sameness of meaning in at least one sense with respect to i and j for A and B and i is a hyponym of j for both A and B .

Co-hyponymy is meaning intersection. If two meanings

intersect in any way at all, then they share that intersection, that superordinate. This is the right way to explicate co-hyponymy in general, I believe, allowing as it does for such implications as (16) and (17).

(16) If x is big then x has size.

(17) If x is a table then x has size.

It is part of the meaning of table that it has size and hence the implication in (17) holds just as surely as does the implication in (16). The meanings of big and table intersect in the area of "size" and they, therefore, both share the superordinate "size" and imply it. Hence "big" and "table" are co-hyponyms of the superordinate "size".

Using the terms colour and coloured in an unusually wide sense to include "black", "white", "grey", "silver", and even "transparent" etc., for convenience, the implications in (18) and (19) also hold. For take any ball one likes, that ball will be of one colour or another. Hence "ball" and "red" are co-hyponyms because they intersect.

(18) If x is red then x has colour/is coloured.

(19) If x is a ball then x has colour/is coloured.

Some semanticists draw a line between what they call linguistic meaning and knowledge of the world. Since the examples I am

using are perhaps on or close to the borderline of these two areas of knowledge, a short digression to consider this proposed division is in order. Leech (1974 : 88) in arguing for this division has this to say:

Let us take, as a particular case, the definition of the word elephant. There are indefinitely many properties of elephants (positive and negative) about which it is possible to construct absurd necessarily false assertions:

The elephant had eighty legs.
Elephants have horns.
Some elephants talk sensibly.
etc.

If we wanted our semantic theory to explain the absurdity of these statements, we should have to include such features as 'four legged', 'hornless', and 'incapable of speech' in our definition of elephant. But if we included ALL such features, we should end up not with a dictionary entry, but with an encyclopedia entry of indefinite length. The two solutions must therefore be either (a) to include some features of this kind but not others; or (b) to exclude all such features. The first solution is unattractive because there are no obvious grounds for distinguishing properties which are criterial to the meaning of the word from those which are not. We arrive at an indefinite number of possible definitions, the choice between which is no less arbitrary than the toss of a coin. In other words, we find ourselves claiming that elephant has indefinitely many meanings, but that none of these meanings is more 'correct' than any other. The second solution, which has no obvious drawbacks of this kind, amounts to a refusal to anatomize the meaning of elephant any further than to define it as 'an animal of the species elephant'. The conclusion of this argument, which will be regrettable to some, is therefore that 'The elephant had eighty legs' and sentences of the same kind, are absurd in a way that semantic analysis cannot explain.

In this quotation from Leech, a number of confusions become apparent. First, we are concerned with getting a semantic

theory right and the amount of space that theory would occupy if written down cannot be a consideration given that it will be a finite amount of space. Second, there are only finite brains with finite storage space; so however extensive the knowledge of elephants is, it must fit into a finite amount of storage and not as Leech suggests an indefinitely large amount of storage. Third, most of the indefinitely large number of features of elephant will be negative, but there are no negative properties of elephant as Leech suggests, but only positive ones. The fact that part of the meaning of elephant is "hornless" comes not from this being a feature that is recorded but as a deduction that there is no feature "horned". Fourth, part of what Leech might be trying to do is to distinguish the particular knowledge of individuals from the general knowledge of the population of speakers. This is a necessary step in establishing what a particular public semantic system involves, but it requires a distinction between a personal semantic system and a public one and Leech does not draw on this distinction in his argument. Lastly, it must be said that a semantic theory which has nothing to say about the falseness of sentences such as "Some elephants talk sensibly" is perhaps a theory which is too weak to come to grips with meaning as it exists in the world.

From my criticisms of Leech, it is apparent that I do not share his view of a distinction between linguistic and extra-linguistic knowledge. Unlike Leech, of course, I am not concerned with a semantic system but only with the semantic apparatus and its

properties. For me, information which is conveyed by non-natural signs must be mediated by the semantic apparatus and involve meaning. Further, because of the way meaning is tied to the world, direct knowledge, i.e. knowledge not gained via nonnatural signs, feeds back into meanings and it just does not seem plausible or sensible to force a distinction between parts of a meaning gained via signs and parts gained in other ways. Jackendoff (1983 : 95) comes to a similar conclusion in respect of semantic structure and conceptual structure, which can be seen as equating with linguistic knowledge and conceptual or world knowledge respectively:

In subsequent chapters I have not been especially careful to preserve the distinction between conceptual structure and semantic structure, tending to use the term conceptual structure when talking about non-linguistic matters and semantic structure when discussing the relation to language.

The time has come to make good on my unscrupulousness. This chapter will argue that once enough machinery has been developed to meet the needs of conceptual structure, the semantic properties of sentences can be formalised with little further ado. It would therefore miss an important generalisation to insist that there is a separate semantic level of mental representation, with its own special characteristics, whose purpose is only to account for logical inference and the like. We will conclude that the terms semantic structure and conceptual structure denote the same level of representation.

Returning now to examples (18) and (19), it is to be noted that although those implications hold, those of (20) and (21) do not, and this despite the fact that "red" and "ball" are

co-hyponyms. The failure of the implications in (20) and (21) seems to stem from the fact that whilst co-hyponyms, such as "red" and "green", are incompatible in this context, as (22) shows, others like "ball" and "red" are not.

(20) If x is red then x is not a ball.

(21) If x is a ball then x is not red.

(22) If x is red then x is not green.

Incompatibility will be discussed in the next section, but there we shall have need of a more restrictive form of hyponymy. This more restrictive type I call kind hyponymy for the reason that in addition to the normal requirements of hyponymy, kind co-hyponyms must each be a kind of the superordinate. The implications in (20) and (21) fail because ball is not a kind of colour even though it is something which contains the meaning "coloured". Kind hyponymy will be defined as follows:

(23) Kind hyponymy

A non-sub, x, is a kind hyponym of a non-sub, y, if x is a hyponym of y and x is also a kind of y, i.e. it is part of the meaning, x, that x is a kind of y.

I do not think that to be a kind of something derives from anything more basic, for, though there may be clues, in general,

that x is a kind of y is something that one learns, a label that is stuck on. Similarity is sometimes a good guide to grouping things as things of the same kind and sometimes a bad guide. Whether something is a kind of something else depends on the criteria applied. On some criteria a whale is a kind of fish, on other criteria it is not a kind of fish at all but a kind of mammal. That red, for example, is a kind of colour is part of the meaning of red. Somebody who did not hold red to be a kind of colour would have a different meaning for red than somebody who did.

Public kind hyponymy may now be specified as in (24).

(24) Public kind hyponymy

A meaning, i , of a public language object, m , or an M group W , M , of a public language is a public kind hyponym of a meaning, j , of a public language object, n , or an M group W , N , of a public language for two associators, A , B , if each of $m(M)$ and $n(N)$ has public sameness of meaning in at least one sense with respect to i and j for A and B , and i is a kind hyponym of j for both A and B .

Before leaving hyponymy, it is necessary in view of the claims of the next section to emphasise that hyponymy and particularly superordinate are defined above in terms of non-subs and not in terms of language items. There will be very many superordinates in a semantic system, only some of

which will have a corresponding term in the language. Lyons (1977 : 301, 302) noting that there are lexical gaps for both superordinates and hyponyms asks whether co-hyponymy can exist if there is no lexical item corresponding to the superordinate. He answers affirmatively; so reinforcing the claim of Leech adopted here that hyponymy is a relationship between meanings, and more strictly still, between non-subs.

5.3 Antonymy

The term antonymy is restricted by some linguists (Lyons, for example, 1977 : 279, who restricts antonymy to gradable opposites) to a particular kind of semantic opposition, whilst other linguists (for example, Katz 1966) use it in a broad sense to cover many types of semantic opposition. Common usage is sufficiently flexible to permit both these extremes of usage without notable deviance being involved. The usage adopted by a particular writer is generally the one which is most convenient for the task in hand. Here I take antonymy in its broad sense as a general term covering a number of more specific types of semantic opposition.

I take as the basic notion underlying all antonymy, incompatibility. Lyons (1968) distinguishes incompatibility from what he calls "mere difference of sense" (: 459). It is a feature of incompatible meanings, and indeed of all antonymic meanings, that they share a certain similarity of meaning,

whereas meanings that are merely different lack this certain similarity of meaning. Hence, "rose" and "tulip" are incompatible because they share the common feature of "flower", but "rose" and "table" are different and not incompatible because they lack a sufficient degree of similarity, even though they do share the feature of "physical object". Exactly what constitutes a sufficient degree of similarity will be one of the issues I address below.

Leech (1974) does not make the distinction between incompatibility and difference of sense, expressing the notion of incompatibility like this:

We may say that two componential¹¹ formulae, or the meanings they express, are INCOMPATIBLE if one contains at least one feature contrasting with a feature in the other. Thus the meaning of woman is incompatible with that of child because of a clash between + ADULT and - ADULT Other meanings incompatible with 'woman' are 'man', 'boy', 'girl', 'cow', not to speak of more remotely contrasted meanings such as 'tree' or 'screwdriver'. (: 100)

This collapsing together of incompatibility of sense and difference of sense raises certain difficulties which become apparent when Leech gives the following rule of inconsistency:

A relation of inconsistency arises between two assertions whenever (the assertions being otherwise identical) the predicate of one assertion is incompatible with that of the other. (: 137)

¹¹ Leech uses componential analysis as the basis of his semantics. In componential analysis, each meaning is seen as composed of a set of features or components. Hence "woman" will have among its meaning components: + HUMAN, + ADULT, + FEMALE.

Leech offers as examples (: 138) of inconsistency of assertions under this rule (1) and (2), but (2) and (3) will also be classed as inconsistent even though the paint can be both blue and thick because "blue" is incompatible under Leech's definition with "thick".

- (1) This paint is scarlet.
- (2) This paint is blue.
- (3) This paint is thick.

The only way out of this difficulty for Leech it would seem is to claim to be using inconsistency in an unusual way. Normally, there is nothing wrong in using every-day terms in a somewhat different technical sense, but inconsistency is held commonly, legally, and logically to have truth functional consequences and a technical use of the term which does not preserve these, as Leech's does not, will have an uphill struggle for acceptance. Hence under Leech's definition (4), (5) and (6) will all be inconsistent with each other. If the truth consequences of normal inconsistency were preserved, then it would be the case that no two of these assertions about the same book could be true together, but it is perfectly possible to have a long, thick, pornographic book.

- (4) This book is long.
- (5) This book is thick

- (6) This book is pornographic.

To avoid the kind of difficulties that are apparent in Leech and also to recognise a seemingly real difference, it is necessary to insist along with Lyons on a distinction between incompatibility of sense and difference of sense. I shall not be concerned in what follows with difference of sense, assuming that it is to be negatively defined in respect of incompatibility.

Incompatibility is a complex subject and here I shall only attempt a first approximation of the kind of mechanism it involves. Incompatibility can be demonstrated by an appeal to the inconsistency of two sentences. Hence, on the assumption that the same ball is being talked about in both (7) and (8), these sentences are inconsistent.

- (7) The ball is blue (all over).

- (8) The ball is red (all over).

An utterance of (7) cannot be true if an utterance of (8) is true, for it is the case that if the ball is red (all over) then it cannot be the case that the ball is blue. Similarly, the pairs (9) and (10) and (11) and (12) are inconsistent on the assumption that the same person and time are being talked of.

- (9) Jane was born on Tuesday.

- (10) Jane was born on Friday.

(11) Jane walked to work.

(12) Jane ran to work.

The inconsistency in these three example pairs of sentences can be traced to the incompatibility of the pairs "blue"/"red", "Tuesday"/"Friday", and "walked"/"ran" in these contexts. The question then is: Why are these pairs incompatible?

A first suggested answer might be that since each pair involves kind co-hyponyms, incompatibility is the result of kind co-hyponymy; but an example will quickly show this not to be the case. (13) and (14) are not inconsistent in spite of "electrician" and "plumber" being kind co-hyponyms to the superordinate, "tradesman".

(13) Paul is an electrician.

(14) Paul is a plumber.

Paul's being an electrician does not preclude him from being a plumber or vice versa, and this seems to show clearly that whilst some kind co-hyponyms are incompatible, others are not.

A second suggestion is that whether kind hyponyms are incompatible or not depends on the nature of their common superordinate. Hence, the superordinates "coloured"¹², "day",

¹² Lyons (1968, 1977) maintains that "coloured" is not a superordinate of "red", "blue", etc. There is, I agree, some dispute about the facts in this matter with the possibility of coloured being ambiguous and only one of its meanings being a superordinate. Whatever the actual situation, however, it does not affect the substance of the example given.

and "move feet" are seen to possess some property that makes their kind hyponyms incompatible. There are, however, counterexamples to this suggestion too. (15) and (16) are inconsistent when used of the same occasion.

(15) Jane is singing.

(16) Jane is reciting.

If Jane is singing, then she is not reciting. The inconsistency comes from the incompatible kind co-hyponyms "singing" and "reciting", having as their superordinate something like "using voice". However, built into the assumption of inconsistency of (15) with (16) is a presumption that Jane is human and has, therefore, only one voice. If it is now assumed that Jane is in fact an alien with two heads and two voices, (15) and (16) are no longer inconsistent. This shows conclusively that it cannot be some special property of the superordinate alone which determines the incompatibility of its kind hyponyms.

Yet a third suggestion is that incompatibility is the consequence of particular contexts. Hence, the incompatibility of "singing" and "reciting" in (15) and (16) is the consequence of the context "Jane is....". Of course, counterexamples to such a suggestion are readily available as (17) and (18) show.

(17) Jane is singing.

(18) Jane is walking.

None of these suggested answers taken individually is adequate and any satisfactory explanation is likely to involve all three. This may seem to be overstating the case because some incompatibles, for example, the meanings of colour terms, can be predicted irrespective of context. However, I would want to claim that although accidentally the meanings of colour terms are always incompatible whatever the context, logically they need not be, and that to treat them as involving a different kind of incompatibility to that residing in examples (9), (10), and (11), (12), results in a lack of generalisation about incompatibility that can be made if it is assumed that incompatibility is a single phenomenon.

Despite the clear counter-evidence, explanations of incompatibility are almost universally given in terms of the supposedly incompatible items themselves and without regard to their context of occurrence. Even Katz's (1972) most careful and revised definition of incompatibility seems to fall into the same error, given that he sets up what he calls anonymous n-tuples of semantic markers (: 52) as the basic notion underlying incompatible constituents of sentences. He describes anonymous n-tuples like this:

The most natural way of defining the notion 'anonymous constituents' so that the definition will be adequate for antonymy sets containing infinitely many particular n-tuples of anonymous expressions is to group semantic markers into anonymous n-tuples on the basis of the incompatibilities they are supposed to represent. This can be accomplished by using some suitable formal device in the formulation

of semantic markers in which they are so represented that the membership of any n -tuple of antonymous semantic markers can be uniquely determined on the basis of formal features of the symbols that comprise the semantic markers. For example, we could write the semantic markers that represent the concepts of maleness and femaleness, assuming them to be incompatible and jointly exhaustive of the sexual domain, in the form ' (S^+) ' and ' (S^-) '....Actually, later we shall find reason to further modify this notation in certain ways, but, generally, the notation for X -antonymous n -tuples of semantic markers will be represented by a common base semantic marker with semantic marker superscripts that indicate the incompatible elements within the domain determined by the base semantic marker. Thus, the general form of an antonymous n -tuple of semantic markers is as shown in (2.50) and as specified in (2.51):

$$(2.50) \quad (M^{(\alpha_1)}, (M^{(\alpha_2)}), \dots, (M^{(\alpha_n)}))$$

- (2.51) Two semantic markers belong to the same antonymous n -tuple of semantic markers if and only if one has the form $(M^{(\alpha_i)})$ and the other has the form $(M^{(\alpha_j)})$, where $i \neq j$ and $1 \leq i \leq n$ and $1 \leq j \leq n$. (: 52)

What this description of incompatible semantic markers does bring out is that such markers must be co-hyponymous with the base marker being their superordinate. While this is a necessary condition it is not a sufficient one for incompatibility as has been shown. The context in which would-be incompatibles occur decides whether in fact they are incompatible in that occurrence. However, when Katz defines incompatibility in context, that context plays no part whatsoever in deciding the incompatibility of the larger meanings in which the would-be incompatibles occur as an examination of his following definition of incompatible shows:

Two constituents C_i and C_j are incompatible (on a sense) if and only if they are not full sentences and they have, respectively, readings R_i and R_j such that R_i contains a semantic marker (M_i) and R_j contains a semantic marker (M_j) and the semantic markers (M_i) and (M_j) are distinct members of the same antonymous n -tuple of semantic markers. (: 53)

In this definition, it is quite clear that incompatibility depends on, and only on, a predetermined, identified set of incompatibles. Since Katz proceeds to define contradictoriness in terms of such sets of incompatibles, the basic mistake over considering incompatibility as context free permeates upwards to cause further and larger errors in more complex meanings. The fact that Katz's infinite antonymous n -tuples are built in some recursive fashion on finite subsets which may themselves have been garnered from actual contexts is, of course, no guarantee that the right prediction of incompatibility will be made in different contexts. As was seen earlier, "singing" and "reciting" are members of an antonymous n -tuple in some contexts, but not in others. I now turn to trying to give a sketch of what is actually involved in incompatibility.

For ease of understanding, I shall first characterise what I think is going on in the case of incompatibility in ordinary logico-semantic terms, then I shall try and relate this in a general way to the model of the semantic apparatus.

If one considers sentence (7) and asks what the colour blue is predicated of, the usual response will be that it is predicated of the ball. And if one asks in the case of (19),

(20), (21), and (22) what softness, roundness, roughness, and heaviness are predicated of, the answer will again be that it is the ball.

(19) The ball is soft.

(20) The ball is round.

(21) The ball is rough.

(22) The ball is heavy.

So, many things can be predicated of the very same ball. The question is: How is it possible for the ball to be blue, soft, round, rough, and heavy all at the same time? The natural answer is that this is possible because these properties concern different aspects of the ball. Being blue concerns the ball's aspect of colour, being round concerns the aspect of shape, being heavy concerns the aspect of weight.

Now the suggestion is that blueness, softness, roundness, etc. are not in fact being predicated directly of the ball at all but, rather, of the colour, resilience, shape, etc. aspects or dimensions of the ball. For this reason, the predications seemingly about the one ball do not clash. However, if one tries to predicate two things of the same aspect at the same time, then there is a clash and an inconsistency results. Hence, the ball cannot be red if it is blue, hard if it is soft, oblong if it is round, smooth if it is rough, or light if it is heavy, because this would amount to its aspects being in two

different states at the SAME TIME.

The emphasis on the same time is needed because of examples such as (23) and (24).

(23) Jane is a walker.

(24) Jane is a runner.

Although, one cannot walk at the same time as one runs, as the inconsistency of (11) and (12) shows, one can be both a walker and a runner even though both activities involve the same aspect of a person, viz. movement of feet. This is possible because to be a walker merely requires that one walks sometimes and to be a runner only requires that one runs sometimes. The times of walking and running need not then coincide and, hence, there is no question of an aspect being claimed to be in two different states at the same time.

The examples of (15) and (16) and the considering of Jane to be a two-voiced alien, however, shows that aspects of people or objects need not be singular. Clearly, where there are two or more occurrences of the same aspect in an object or person, then two or more different states of these aspects are possible. Hence, when Jane has two voices, she has two voice aspects, and each may be in a different state. If an object had two colour aspects or two texture aspects, then it could be both

red and blue¹³ or rough and smooth at the same time. It is buried deep in our conception of the world that objects (as opposed to different parts of objects) can only have one colour and one texture aspect, but this appears to be an accidental rather than a logical necessity. Suppose, for example, our eyes were prismatic, then whilst a red object or a blue object would still be red or blue, an object which reflected white light would be red and blue and yellow, etc., all over at the same time. Such an object would not just be multicoloured since that means that different parts of it have different colours. In the imagined case, every part of the object would be all the colours of the spectrum at the same time.

Returning to the example concerning the ball, it can be said that the roundness and roughness of the ball can never be in opposition because they involve different aspects of the ball and the property of roundness cannot be predicated of the aspect of texture any more than the property of roughness can be predicated of the aspect of shape. There is, it would seem, something in the nature of properties which restricts them to particular aspects.

Leaving objects and properties and considering meaning, one can see that an aspect of an object will correspond to a particular part of the meaning (aspect feature) of the name of

¹³ An object can, of course, be both red and blue at the same time but by this is then meant that it is partly red and partly blue which is not the same as being red all over and blue all over.

the object and that meanings which qualify this aspect feature must somehow be restricted to doing just that. One way this could happen, and indeed the way it seems to happen, would be for the meanings which qualified an aspect feature to themselves contain that aspect feature, i.e. the qualifying meanings imply the aspect feature. This, of course, amounts to the aspect feature being the superordinate of the qualifying meanings, which are its hyponyms. This brings us back to the idea that co-hyponymy underlies incompatibility with now, however, the additional concept of incompatibility also depending on the number of occurrences of the superordinate of the hyponyms in the meaning which is being qualified.

Quite generally, but with a particular restriction which will be introduced shortly, it can now be said that all kind co-hyponyms are incompatible if they qualify a single¹⁴ occurrence of their superordinate. Whether in fact they are incompatible in any particular context will depend on the number of occurrences of their superordinate that they qualify. Hence, talent is a multi-aspect of people, so that (25) and (26) are not inconsistent.

(25) Jane is a dancer.

(26) Jane is a singer.

¹⁴ Occasionally in the literature this requirement for singleness is noted, though not pursued. Lehrer (1974 : 25), for example, notes that for "Bill punched Mary" and "Bill kicked Mary" to be inconsistent requires not only that "kick" and "punch" are related meanings but also that one action is involved.

However, in a context which establishes a single talent only and hence a single occurrence of the superordinate "talent" in the qualified meaning, "dancer" and "singer" will become incompatible as in the case of (27) and (28).

(27) Jane has only one talent: She's a dancer.

(28) Jane has only one talent: She's a singer.

As a preliminary to trying to relate this view of incompatibility to the model, it is necessary to introduce the notion of predication relator. A predication relator is one that directly associates its second argument with its first argument, so adding the meaning of the second argument to the first as if the second argument were a relator taking the first argument as its argument. How this is achieved is of no particular concern, but the fact that it is is important in recognising in the model of the semantic apparatus a phenomenon which occurs in all natural languages. The usefulness of predication relators is not hard to see since they provide a way of uniting two non-relators in a structure. Without them, such meanings as: "The woman is a school teacher" would be impossible. Corresponding to predication relators in English will be, along with the expected copula, the perhaps unexpected prepositions such as in and on. That these are predication relators in nature will be readily seen if it is observed that prepositional phrases are always adjectival or adverbial

in effect, always qualifying or modifying their first argument.

Two non-subs will be predicationally associated if either they are associated by a predication relator or one non-sub is included in the other. (The notion of inclusion was explicated in the last chapter). Incompatibility can now be specified as follows:

(29) Incompatibility

Incompatibility of two kind co-hyponyms occurs if they are predicationally associated at the same time with a co-hyponym which contains only one occurrence of their superordinate and neither of the kind co-hyponyms is a superordinate of the other.

Although being a kind hyponym implies being a hyponym, I shall not in general redundantly use the terms in this way. So in (29) a co-hyponym is not, even though strictly it could be, a kind co-hyponym. Kind co-hyponyms lead to straight contradiction if predicated of each other as one would expect, but this is not an aspect of incompatibility but merely a consequence of the more basic fact that saying that two different things are the same fails because by definition they are not.

The requirement that neither kind co-hyponym is to be the superordinate of the other is needed because of pairs like "red"/"crimson", "cat"/"kitten", "pear"/"doyen du Comice" (a variety of pear). In each case, the first term is a

superordinate of the second, but, clearly, if x is crimson then x is also red, and no question of incompatibility arises. Kind co-hyponyms only have the general property of being potentially incompatible if one is not the superordinate of the other.

An idea of how (29) works can be had by a consideration of examples (7) - (14). In (7) and (8) "ball" is a co-hyponym, but not a kind co-hyponym of "blue" and "red". Furthermore "ball" contains only one occurrence of the superordinate "coloured" because it is part of the meaning of ball and more generally part of the meaning of terms referring to physical objects, that it can only have one colour all over. "blue" and "red" are incompatible in this context because they are both associated with the single superordinate "coloured" of "ball". (9) and (10) offer a good example of the predication relator "on". "born" is a co-hyponym of "Tuesday" and "Friday" because they have in common a superordinate something like "particular day". Being born for a human (as opposed to a star or galaxy) occurs on a particular day and this is captured in the meanings of (9) and (10). Again, "Tuesday" and "Friday" are incompatible in this context because they are both associated with a single occurrence of their superordinate. Examples (11) and (12) are straightforward, but (13) and (14), where kind co-hyponyms are not incompatible, is worthy of study. It is part of being a man that one can have one or MORE trades. The meaning of man captures this fact and since Paul is assumed to be a man then

the meaning of Paul captures this fact. However, the meaning does not specify how many trades, if any, a man should have and this indicates that more than one occurrence of the superordinate "tradesman" is available if required. Hence, since in general there appears to be no upper bound on the number, there will always be an occurrence of this superordinate for a kind hyponym. The failure of "electrician" and "plumber" to be incompatible in the context of (13) and (14) is directly attributable to this multiple availability of occurrences of their superordinate. Precisely what mechanism makes it possible for the meaning of Paul to have none or a dozen occurrences of the superordinate is unclear, but it appears to be connected with modality - a subject I have not attempted to cover in this work.

Incompatibility of meanings can be specified for a public semantic system, but it has to be relativised to some context, C, as in (30).

(30) Public incompatibility

A meaning, i , of a public language object, m , or an M group W, M , of a public language is publicly incompatible with a meaning, j , of a public language object, n , or an M group W, N , of a public language in a context, C, for two associators, A, B, if $m(M)$ and $n(N)$ have public sameness of meaning in at least one sense with respect to i and j for A and B, and i is incompatible with j in the context C for both A and B.

Kind hyponyms come in two types: categoric and non-categoric.¹⁵ Categoric kind co-hyponyms divide up the area of meaning they cover in a fixed way. The kind hyponyms considered so far in this section have all been categoric. Non-categoric kind co-hyponyms retain a fixed relation to each other but their meanings are not fixed. Categoric kind hyponyms allow inferences which are not possible with non-categoric ones; hence, the logical form of the argument in (31) is identical to that in (32), but whilst (31) is a sound argument, (32) is not as can be readily seen.

(31) x is a white mouse
a white mouse is an animal
 x is a white animal

(32) x is a big mouse.
a big mouse is an animal.
 x is a big animal.

Meanings such as "big", "medium", "small", form non-categoric, kind, co-hyponymous groups. Sapir (1944 : 122, 123) noted that

¹⁵ Cf. Katz' relative-adjective/absolute-adjective distinction (Katz 1972 : 254).

these carried what he called implicit grading¹⁶:

Such contrasts as "small" and "large", "little" and "much", "few" and "many", give us a deceptive feeling of absolute values within the field of quantity comparable to such qualitative differences as "red" and "green" within the field of color perception. This feeling is an illusion, however, which is largely due to the linguistic fact that the grading which is implicit in these terms is not formally indicated, whereas it is made explicit in such judgements as "There were FEWER people there THAN here" or "He has MORE milk THAN I".

Non-categoric, kind hyponyms (NCKH) require a measure or norm¹⁷ to make them categoric in a particular context. About all one can say of the meaning of big in isolation is that it is a measure of size; one cannot say what size. Once, however, a norm has been added then one can say something about size. Where

¹⁶ The terms categoric and non-categoric are not equivalent to the terms ungradable/non-gradable and gradable respectively as used by Lyons (1968, 1977). Many categoric hyponyms are gradable but they are not implicitly graded. There is some possibility of confusion in this area for two reasons: First, the quotation from Sapir above (which Lyons quotes both in 1968 and 1977) seems to imply that "red" is absolute and not gradable; however, Sapir tells us: "Every quantifiable, whether existent (say "house") or occurrent (say "run") or quality of existent (say "red"... is intrinsically gradable" (1944 : 123), and surely the existence of redder and more red proves his point. Second, as pointed out, Lyons uses the term antonym in a narrow sense and opposes it to contrast. The meanings of colour terms for Lyons are not antonymous but contrastive (1977 : 287) and this means he has no incentive to point out the wrong impression that the quotation from Sapir is likely to induce when coupled with his own gradable/ungradable distinction. The important difference, and the one Sapir was anxious to point out in the above quotation, is between implicitly graded kind hyponyms like "big" and "small" and the non-implicitly graded kind hyponyms like "red" and "green".

¹⁷ Cf. Leech 1974 : 109.

does the norm come from? The norm in a particular context of the use of an NCKH seems to be adopted from the subject of predication. Hence a big mouse is a mouse which is big with respect to the norm "mouse", i.e. a big mouse is big for a mouse but not necessarily for anything else. In (32) two norms are being used: a "mouse" norm and an "animal" norm, and since these are not interchangeable, the argument is unsound.

This requirement of NCKHs for a norm is an intrinsic feature of them, i.e. without it they cease to be NCKHs, and, as far as I can see, cannot be derived from other components in or features of the model of the semantic apparatus. I shall assume, therefore, that what NCKHs have in common is the property of being normable, i.e. of being able and requiring to take a norm. The property of being normable will derive from a specific type or types of discriminators which form part of every NCKH. Such discriminators are not reducible to other types of discriminator any more than the discriminators which distinguish red are reducible to other types. The difference between non-categoric, kind hyponyms and categoric, kind hyponyms will now be that of the former having the normable property and the latter lacking it.

NCKHs are incompatible in exactly the same way as categoric, kind hyponyms, but they differ for inference purposes by not being transferable as qualifiers to the superordinates of the meanings they qualify. Hence a big puppy is not a big dog even though "dog" is a superordinate of "puppy". This is in contrast to categoric, kind hyponyms where it is the case that a black

puppy is a black dog.

Within the types of antonymy discussed above, various subcategories could and have been distinguished. I shall not attempt to individuate these subcategories here except in respect of complementarity,¹⁸ which has considerable inferential consequences. Complementary meanings exclude one another, so that from the assertion of one, the other can be denied, and from the denial of one the other can be asserted, always assuming that the assertions and denials are within the application of the complementary meanings. Hence, of something that can live and die, i.e. an animate, if it is asserted that it is alive then it can be inferred that it is not dead, and if it is denied that it is dead then it can be inferred that it is alive. Complementaries are a special case of categoric, kind co-hyponyms, with the number of kind co-hyponyms being restricted to two and neither co-hyponym being a superordinate of the other. As with other kind co-hyponyms, incompatibility of complementaries depends on context, and it cannot be assumed that complementaries are incompatible per se.

(33) Complementarity

Two non-subs, x, y, are complementary if they are kind

¹⁸ Lyons (1968 : 463) distinguishes between complementarity and antonymy, reserving the latter term for gradable opposites and the former for ungradable. In 1977 : 270 ff, Lyons brings both types of opposition under the umbrella of antonymy but prefers the term opposition to the former.

co-hyponyms, neither has any other kind co-hyponym in respect of the superordinate common to x and y, and neither x nor y is the superordinate of the other.

(34) Public complementarity

Two meanings, i, j, of two public language objects, m, n, or two M group Ws, M, N, of a public language are complementaries for two associators, A, B, if m and n (M and N) have public sameness of meaning in at least one sense with respect to i and j for A and B and i and j are complementaries for both A and B.

5.4 Analyticity

There has long been held to be a distinction between synthetic statements which are true or false in virtue of extra-linguistic considerations, and analytic statements which are true or false in virtue of their meanings alone. In "Two Dogmas of Empiricism" (1951), Quine attacked this distinction, and any treatment of the analytic/synthetic distinction which supports that distinction, as mine does, must needs defend itself against Quine's position. Quine sums up his position like this:

It is obvious that truth in general depends on both language and extralinguistic fact. The statement 'Brutus killed Caesar' would be false if the world had been different

in certain ways, but it would also be false if the word 'killed' happened rather to have the sense of 'begat'. Thus one is tempted to suppose in general that the truth of a statement is somehow analyzable into a linguistic component and a factual component. Given this supposition, it seems reasonable that in some statements the factual component should be null; and these are the analytic statements. But, for all its a priori reasonableness, a boundary between analytic and synthetic statements simply has not been drawn. That there is such a distinction to be drawn at all is an unempirical dogma of empiricists, a metaphysical article of faith. (: 36, 37)

In the course of these somber reflections we have taken a dim view first of the notion of meaning, then of the notion of cognitive synonymy, and finally of the notion of analyticity. (: 37)

Quine feels that he has cast sufficient doubt on the notions listed in the second quotation, viz, meaning, synonymy, and analyticity, to render the conclusion of the first quotation acceptable. Quine's method of proceeding is this: First he implies that the notion of meaning is beyond explication except in terms of synonymy and analyticity:

For the theory of meaning a conspicuous question is the nature of its objects: what sort of things are meanings? A felt need for meant entities may derive from an earlier failure to appreciate that meaning and reference are distinct. Once the theory of meaning is sharply separated from the theory of reference, it is a short step to recognising as the primary business of the theory of meaning simply the synonymy of linguistic forms and the analyticity of statements; meanings themselves, as obscure intermediary entities, may well be abandoned. (: 22)

Second, Quine shows that synonymy, divorced from any support by an independent notion of meaning is not generally explicable.

Analyticity, being generally dependent on synonymy¹⁹, suffers the same fate.

I shall not consider Quine's arguments against synonymy and analyticity per se because these really only count if Quine was right to dismiss an independent notion of meaning. In "Two Dogmas of Empiricism", Quine offers no reason for dismissing the notion of meaning and he is clearly aware of this shortcoming because in a footnote in the reprinted edition he directs the reader to two other articles: "On What There Is" (1948) and "The Problem of Meaning in Linguistics" (1953b). However, these articles offer no argument against an independent notion of meaning other than that there does not seem to be any way of explicating it. Quine's behaviourist outlook leads him to reject mental entities as explanatory devices and I share this rejection if by mental entity is meant "non-physical entity", but this gives Quine no grounds for dismissing brain entities or relationships between brain entities as being meanings, as here proposed; and it is no argument against such entities and relationships that they cannot be directly observed since Quine readily embraces the notion of subatomic particles as long as these are useful:

¹⁹ And on antonymy, cf. "The red ball is blue", although Quine never discusses contradictions which are so in virtue of incompatibles as opposed to negation.

Objects at the atomic level are posited to make the laws of macroscopic objects, and ultimately the laws of experience, simpler and more manageable; and we need not expect or demand full definition of atomic and subatomic entities in terms of macroscopic ones, any more than definition of macroscopic things in terms of sense data. Science is a continuation of common sense, and it continues the common-sense expedient of swelling ontology to simplify theory. (1951 : 45)

At bottom, Quine's only objection to an independent notion of meaning, i.e. one that is logical prior to synonymy, is that such a notion has not been explicated. What I have done is to make a first attempt on such an explication and I feel it shows sufficient promise to warrant further attempts and to reject Quine's move from meaning to synonymy and analyticity. Once one rejects such a move, then Quine's argument fails to bite and one is left free to offer explanations for not the "a priori" synthetic/analytic distinction, but the empirically observed distinction that some of our statements seem to come out true or false however the world is while others do not.

The terms analytic and synthetic are applied to statements, but it is really with the meanings of statements that these notions are concerned. This can be readily seen in cases where the statement is only analytic in one sense. So an analytic statement is a statement which has an analytic meaning. But it would be misleading to talk solely in terms of analytic meanings because many structures of non-subs could be analytic even though they are not meanings. This follows from the definition of meaning which requires a non-sub to be associated

with a sub in order for it to be a meaning. To avoid this difficulty, I shall talk about analytic and synthetic structures. The latter will not further concern us since they are defined negatively with respect to analytic structures. An analytic structure is a structure of non-subs which is such that any and every match makes the structure come out either always true or always false. In other words, matching is irrelevant to the truth value of an analytic structure. For an analytic structure which is always true I shall use the term tautologous structure, and for one that is always false the term contradictory structure.

To explicate the notion of analytic structure in terms of the semantic apparatus requires the introduction of a special kind of predication relator which I shall call definitional relator. The definitional relator corresponds in English to the copula and it is not reducible as far as I am aware to other entities of the semantic apparatus. There are aspects of the if, then construction which make it look like a realisation of another definitional relator, but since if, then constructions can be translated into ones involving the copula, it is fair to assume that there is only one definitional relator after all. (1), for example, is analytic in one sense, but it is equivalent to (2).

- (1) If a man is a bachelor, then he is unmarried.
- (2) All men who are bachelors are unmarried.

Sentences (3) - (9) exemplify some of the range of analytic

constructions that must be explained in any account of analyticity.

- (3) A triangle is a triangle.
- (4) A bachelor is unmarried.
- (5) A bachelor is a man.
- (6) A man who is not married is a man.
- (7) A big red book is a big book.
- (8) A green hat is not a blue hat.
- (9) A triangle is not a triangle.
- (10) A red ball is a blue ball/blue

The form of these examples is interesting because they are all generic. This is not at all a requirement of analyticity as (11) shows, but it will be recalled that in chapter 2 it was claimed that true generics are not things which can have a truth value, and it was pointed out that analytic statements were exceptions in this respect. Their exceptionness is more apparent than real, however, because analyticity is independent of truth in the sense that, although analyticity tends to be characterised in terms of truth and has consequences for truth values, truth and analyticity arise separately in the semantic apparatus and this explains why an utterance may be analytic, generic, and have a truth value in spite of my claim that generics are not candidates for truth values in general.

- (11) My sister is my sister.

Throughout, in dealing with analyticity, I shall assume that examples and their corresponding structures which involve conjunctions are excluded from the discussion. This is a matter of convenience and clarity, not one of necessity. Trying to specify for tautologous and contradictory structures involving non-subs corresponding to conjunctions would make the definitions so complicated that they would be extremely difficult to read. Some of the complications can be seen in examples (12) and (13) where in (12), although the predicate occurs in the subject, it does not occur in both conjuncts of the subject, and where in (13) one conjunct is of definitional form and the other is not.

(12) Robots and pigs are animals.

(13) A triangle is a triangle and sharks eat fish.

Examples (3) - (8) are tautologies, and of these, (3), (5), and (7) are positive tautologies, i.e. they do not involve negation. As a first step, a positive, tautologous structure may be specified as follows:

(14) Positive, tautologous structure

A positive structure is tautologous if it contains an occurrence, x , of the definitional relator whose first argument is non-relative, and the first argument of x contains the second argument of x .

By non-relative argument is meant one that does not correspond to just a relative pronoun. This condition is needed to stop examples like (15) corresponding to tautologous structures.

- (15) A triangle which is a figure may be seen in any book
of geometry.

The sense of contains being used in (14) is that given and discussed in chapter 4; so the reduction inferences apply, and this accounts for example (7) where "a big red book" is reduced to "a big book".

Examples (4), (6), and (8) are tautologies also, but they involve negation. (8) is a special case since it relies on incompatibility and this is to be specified under contradiction. Since all denials of contradictions are tautologies, a clause to this effect in the general specification of tautology will be required. (14) can be generalised to include all tautologous structures by the addition of several clauses.

(16) Tautologous Structure

A structure is tautologous if:

- Either (A) It is the denial of a contradictory structure,
or (B) It contains an occurrence, x, of the
definitional relator whose first
argument is non-relative and contains its
second argument providing always that:

- (i) if the second argument of x lies partly or wholly within the scope of the negator, then that part or whole must lie within the scope of the negator in the first argument of x .
- (ii) if the first argument of x lies partly or wholly within the scope of the negator, then that part or whole, if it occurs in the second argument of x , must lie within the scope of the negator also.

Example (4) corresponds to a tautologous structure under (16) because, although it contains a negator, it meets condition (16i), and (6) is also tautologous under (16) because its negation is not relevant to the conditions on (B). Example (8) is tautologous under (16), of course, because it is the denial of a contradiction. Condition (Bii) is needed to stop sentences like (17) being tautologous. The problem in cases like (17) is that the predicate occurs twice in the subject, once positive, once negative. (Bii) requires that only the negative occurrence count.

(17) The fox which is not really a fox is a fox.

Examples (9) and (10) are contradictory. A contradictory structure can be specified as follows:

(18) Contradictory structure

A structure is contradictory if:

- Either (A) It is the denial of a tautologous structure.
or (B) It contains an occurrence, x , of the
definitional relator whose first argument is
non-relative and incompatible with its second
argument.

(9) corresponds to a contradictory structure under (18) (A) and (10) under (18) (B).

The notions of tautologous and contradictory structures apply only to individual associators and to extend these to the public semantic notions of tautologous and contradictory statements, the following specifications are needed:

(19) Public tautology

An M group W, M , of a public language is a public tautology for two associators, A, B , if M has public sameness of meaning in at least one sense, i , for A and B , and A has semantic structure, S_1 , corresponding to i and B has semantic structure, S_2 , corresponding to i and S_1 and S_2 are tautologous structures for A and B respectively.

(20) Public contradiction

An M group W, M , of a public language is a public

contradiction for two associators, A, B, if M has public sameness of meaning in at least one sense, i , for A and B, and A has semantic structure, S_1 , corresponding to i and B has semantic structure, S_2 , corresponding to i and S_1 and S_2 are contradictory structures for A and B respectively.

The view of analyticity taken here is the traditional one first made explicit by Kant:

In all judgements wherein the relation of a subject to the predicate is cogitated (I mention affirmative judgements only here; the application to negative will be very easy), this relation is possible in two different ways. Either the predicate B belongs to the subject A, as somewhat which is contained (though covertly) in the conception A; or the predicate B lies completely out of the conception A, although it stands in connection with it. In the first instance, I term the judgement analytical, in the second, synthetical. Analytical judgements (affirmative) are therefore those in which the connection of the predicate with the subject is cogitated through identity; those in which this connection is cogitated without identity, are called synthetical judgements. The former may be called explicative, the latter augmentative judgements; because the former add in the predicate nothing to the conception of the subject, but only analyse it into its constituent conceptions, which were thought already in the subject, although in a confused manner; the latter add to our conceptions of the subject a predicate which was not contained in it, and which no analysis could have ever discovered therein.

(From a translation by Meiklejohn (1934 : 30))

The identity which Kant talks of in this passage is, I claim, an identity of meaning, and it is identity of meaning or parts of meaning that underlie the account of sense relations offered in this chapter. Identity of meaning is not by itself, as has been

seen, sufficient to explicate all the sense relations discussed because non-categoric, kind hyponyms rely on the normable property and kind hyponyms themselves require to be linked to their superordinate by the kind-of property. Nonetheless, meaning identity remains the bedrock on which sense relations rest.

The attack that Quine has mounted on Kant's distinction relies on his implicit claim that meaning itself cannot be explicated independently of synonymy and analyticity. I have attempted in the preceding chapters, by making a start on an explication of what meaning is, to show that Quine's claim is wrong.

APPENDIXList of Terminology

<u>Argument (a)</u>	A relator or non-relator which is associated with an argument-place of a relator.
<u>Argument-place (ap)</u>	An order-marker associated with a focal together with some or no other discriminators.
<u>Associate/ Association:</u>	To connect in some manner so that access to one item in the association gives access to all the others in that association. Each use of an associative link is distinctive and ordered.
<u>Associator (A)</u>	Someone or something in which discriminators may be associated with focals, collects with collects via focals and markers with collects.
<u>Augmentation</u>	The association of any stimulum or invocatum with an invocatum.
<u>Collect (c)</u>	An association of one or more discriminators with a focal or an association of one or more collects with others.

- Congruous Argument An argument which has semantic congruity with its argument-place.
- Delta The set of conditions, if any, which must obtain, irrespective of matching, if a representatum is to be held true.
- Discriminator (d) A "bit" of and within an associator which is distinct in respects other than spatio-temporal ones and which may be associated with focals, but no proper subpart of which can be independently associated with a focal.
- Focal (f) A "bit" of and within an associator which is not necessarily distinct in respects other than spatio-temporal ones and which may be associated with discriminators and other focals, but no proper subpart of which can be independently so associated.
- Gamma The set of conditions, if any, which must obtain, irrespective of failure to match, if a representatum is to be held false.

Immediate
Inclusion

A relator immediately includes its argument(s) but not the argument(s) of its arguments.

Inclusion

A relator, r, includes its argument(s) and if a is any argument included in r, then r also includes any argument of a.

Invocation

The stimulation of a discriminator, discriminators, collects, stimulata or invocata via associative links. Invocations are distinctive and ordered.

Match

A representatum matches or is a match if its time index, if any, agrees with the occurrent time of a stimulum and its contents, including any augmentation, are contained in that stimulum except insofar as specified otherwise by negative, quantifying or intensional elements in the representatum.

Negative
Representata
Match

A negative representatum matches if all parts of it not within the scope of the negator match and each scopal segment of it fails to match. Where scopal segment is defined as

that part or whole of of representatum which lies within the scope of the negator and is the greatest such part that lies within that particular scope of the negator.

Non-relator (nr)

A non-sub which is not a relator.

Non-sub (ns)

A collect which is not a sub.

Order-marker (o)

A distinguished discriminator or collect which is associated with a focal to form an argument-place which may be associated with a non-sub to form a relator. The order-marker indicates and effects the ordering of any argument associated with the argument-place in respect of any relator of which it is part. Order-markers are, therefore, of various degrees, and this may be indicated by adding subscripts like so: $o_1, o_2 \dots o_n$, where o_1 is to be an argument-place marker for the first argument of the relator, o_2 for the second, and so on.

Particulariser (P)

A distinguished discriminator or collect associated with a non-relator to indicate and effect that that non-relator be taken as a particular.

<u>Relator (r)</u>	A non-sub associated with one or more argument-places.
<u>Representatum</u>	An invocatum capable in principle of having a truth value.
<u>Semantic Congruity</u>	Semantic congruity obtains between an argument-place and its associated argument if all of the semantic features apart from the order-marker present in the argument-place are also present in the argument and if any order-marker present in the argument is also present in the argument-place.
<u>Semantic Structure</u>	A single non-sub or a structure of non-subs.
<u>Sign-marker (SM)</u>	A distinguished discriminator or collect associated with a collect to indicate and effect that that collect be taken as a sub.
<u>Stimulation</u>	The stimulation of a discriminator, discriminators or collects other than by association. Stimulations are distinctive and ordered.

Structure

An association which consists of argument(s) and relator(s) and in which the argument(s) are associated with the argument-place(s) of the relator(s).

Sub (s)

A collect associated with the sign-marker.

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